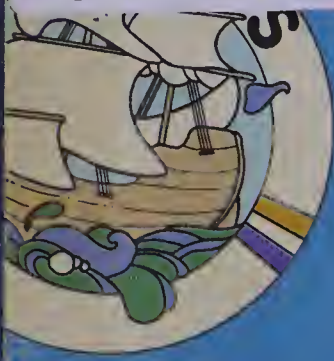


UNIVERSITY OF ALBERTA LIBRARY



0 0001 9138 569



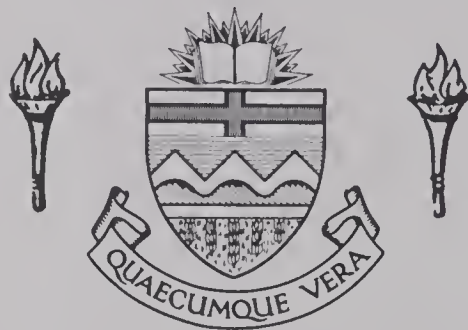
TEACHER'S EDITION  
HOLT MATHEMATICS SYSTEM

# BOOK 3



0  
3  
•  
2

Ex libris  
UNIVERSITATIS  
ALBERTAENSIS









**Teacher's Edition**

**Holt**

**Mathematics**

**System**

**Book Three**

*Author and General Editor of the Holt  
Mathematics System*

**Marshall P. Bye**  
**Supervisor of Mathematics**  
**Calgary Board of Education**  
**Calgary, Alberta**

*Author*

**Wendy E. Auger**  
**Consultant in Primary Education**  
**Scarborough Board of Education**  
**Scarborough, Ontario**

**HOLT, RINEHART AND WINSTON OF CANADA, LIMITED**  
**TORONTO**

**Marshall P. Bye**

Supervisor of Mathematics  
Calgary Board of Education  
Calgary, Alberta

**Wendy E. Auger**

Consultant in Primary Education  
Scarborough Board of Education  
Scarborough, Ontario

*Reviewing Consultants*

**Douglas D. Farrar**

Superintendent of Schools  
Lambton County Board of Education  
Sarnia, Ontario

**Richard Holmes**

Specialist in Mathematics  
Calgary Board of Education  
Calgary, Alberta

**Heather J. Kelleher**

Learning Assistant  
John Robson Elementary School  
New Westminster, B.C.

**Ron Wittner**

Vice-Principal  
Henry Janzen School  
Regina, Saskatchewan

Creative art by Larry Serblowski.  
Assembly and technical art by David Hunter.  
Teacher's Edition art by Annette Tatchell.

Consulting Editor Rob Devine  
Production Editor Sharon Dzubinsky

**Canadian Cataloguing in Publication Data**

Bye, Marshall P., 1928-

Teacher's edition, Holt mathematics system,  
book 3

Supplement to: Bye, Marshall P., 1928- Holt  
mathematics system, book 3.

Includes index.

ISBN 0-03-920009-4

1. Mathematics — 1961- I. Auger, Wendy E.,  
1940- II. Bye, Marshall P., 1928- Holt  
mathematics system, book 3. III. Title. IV. Title:  
Holt mathematics system, book 3.

QA107.B9412

510

C79-094370-0

It is illegal to reproduce any portion of this book except  
by special arrangement with the publishers.

Reproduction of this material by any duplication  
process whatsoever is a violation of copyright. Special  
permission has been granted for the duplication of the  
Cumulative Test Item Bank.

Copyright © 1980 by  
Holt, Rinehart and Winston  
of Canada, Limited  
Toronto

All Rights Reserved

ISBN 0-03-920009-4

Printed in Canada

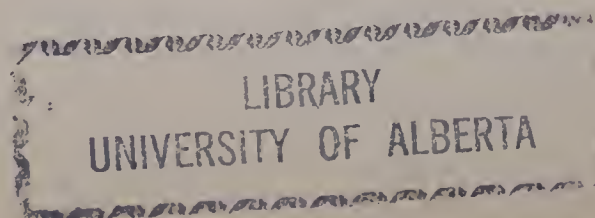
2 3 4 5 84 83 82

# TEACHER'S EDITION CONTENTS

|   |       |
|---|-------|
| <b>Pupil Text Contents</b>                | iv    |
| <b>Scope and Sequence</b>                 | v     |
| <b>Teacher's Commentary</b>               | xv    |
| <b>Activity Reservoir</b>                 | xix   |
| <b>Problems of the Week</b>               | xxiii |
| <b>Cumulative Test Item Bank</b>          | xxvi  |
| <b>Chapter 1</b> Overview and Commentary  | xxxvi |
| <b>Chapter 2</b> Overview and Commentary  | 36    |
| <b>Chapter 3</b> Overview and Commentary  | 80    |
| <b>Chapter 4</b> Overview and Commentary  | 100   |
| <b>Chapter 5</b> Overview and Commentary  | 124   |
| <b>Chapter 6</b> Overview and Commentary  | 156   |
| <b>Chapter 7</b> Overview and Commentary  | 188   |
| <b>Chapter 8</b> Overview and Commentary  | 216   |
| <b>Chapter 9</b> Overview and Commentary  | 244   |
| <b>Chapter 10</b> Overview and Commentary | 264   |
| <b>Basic Skills Check Up</b>              | 294   |
| <b>Extra Practice Exercises</b>           | 295   |
| <b>Index</b>                              | 300   |

# PUPIL TEXT CONTENTS

|           |   |            |
|-----------|---|------------|
| <b>1</b>  | <b>WHOLE NUMBERS</b><br>Place Value to 2 Digits • Addition and Subtraction: Basic Facts                                 | <b>1</b>   |
| <b>2</b>  | <b>WHOLE NUMBERS</b><br>Place Value to 3 Digits • Addition and Subtraction • Measurement:<br>Centimetres and Metres     | <b>36</b>  |
| <b>3</b>  | <b>GEOMETRY</b><br>3D Shapes • Plane Shapes • Symmetry and Similarity   | <b>80</b>  |
| <b>4</b>  | <b>WHOLE NUMBERS</b><br>Place Value to 4 Digits • Addition to 4-Digit Sums • Measurement:<br>Length and Mass            | <b>100</b> |
| <b>5</b>  | <b>FRACTIONS AND DECIMALS</b><br>Concept of a Fraction • Decimal Notation • Measurement: Length<br>and Capacity • Money | <b>124</b> |
| <b>6</b>  | <b>WHOLE NUMBERS</b><br>Multiplication and Division   | <b>156</b> |
| <b>7</b>  | <b>MEASUREMENT</b><br>Perimeter, Area, and Volume • Time • Temperature  | <b>188</b> |
| <b>8</b>  | <b>WHOLE NUMBERS</b><br>Multiplication and Division   | <b>216</b> |
| <b>9</b>  | <b>GEOMETRY AND GRAPHS</b><br>Plane Shapes • Pictographs and Bar Graphs   | <b>244</b> |
| <b>10</b> | <b>WHOLE NUMBERS</b><br>Multiplication and Division   | <b>264</b> |
|           | Check Up — Chapters 1 to 5  | <b>294</b> |
|           | Check Up — Chapters 6 to 10   | <b>294</b> |
|           | Extra Practice — Chapters 1 to 10   | <b>295</b> |





# SCOPE AND SEQUENCE

The following chart gives an overview of mathematical content presented at this grade level, the grade level below, and the grade level above. It shows the extent to which each mathematical topic is presented from grade

to grade in the HOLT MATHEMATICS SYSTEM. It is hoped that this will help you to better prepare your lessons for a successful teaching experience.

## Grade 2

### Number and Numeration

Concept of number, p. 1

Order of numbers

zero to one hundred,

pp. 3-8, 53

one hundred to nine hundred

ninety-nine, pp. 118-120, 156

Comparing numbers

greater than, one greater

than, pp. 11-12, 15-16

less than, one less than, pp. 13-16

using  $>$ ,  $<$  signs, pp. 15-16, 57-58,

121-122, 156

before, after, between, pp. 55-56

Ordinal numbers first through

twentieth, pp. 17, 181

Skip counting

counting by tens, pp. 47, 124,

160, 248

counting by twos, pp. 60, 160, 248

counting by fives, pp. 59, 74, 123,

160, 248

counting by hundreds, p. 248

Place value

tens and ones, pp. 49-52, 94

hundreds, tens, and ones,

pp. 113-117

regrouping tens and ones,

pp. 211-212

Fractions

halves, one half, pp. 83-84,

241-242

thirds, one third, pp. 85-86,

241-242

fourths, one quarter, pp. 87-88,

241-242

tenths, p. 237

## Grade 3

### Number and Numeration

Word names for numbers (0-9999),

pp. 1, 5, 104-105

Place value

tens and ones, pp. 2-4

hundreds, pp. 41-42

thousands, pp. 101-107

Comparing numbers

using  $>$ ,  $<$  signs, pp. 6, 43,

106, 286

more, less, greater, fewer,

pp. 7, 29

fractions, p. 127

Ordinal numbers first through

twenty-sixth, p. 11

Skip counting

counting by twos, pp. 18, 158, 247

counting by threes, pp. 19,

158, 247

counting by fours, p. 164

counting by fives, pp. 167, 247

counting by tens and hundreds,

p. 247

Odd and even numbers, p. 20

Roman numerals to twelve, p. 32

Fractions

equal parts, p. 125

naming fractions, pp. 126, 128

comparing fractions ( $>$ ,  $<$ ),

p. 127

tenths, p. 129

parts of a set, p. 288

Decimals

tenths, pp. 130-131

ones and tenths, p. 132

## Grade 4

### Number and Numeration

Using digits to write numbers 0-9, p. 1

Names of numbers 0-999 999,

pp. 16-17, 33-34, 39

Place value, expanded notation

ones and tens, pp. 2-3

3 digits, p. 16

4 digits, p. 33

5 digits, p. 34

6 digits, p. 39

tenths, p. 145

hundredths, pp. 214-219

Comparing numbers through 9999,

pp. 35-36, 230

decimals, p. 146

fractions, p. 13

Ordinals, first through

fifteenth, p. 4

Skip counting

by twos through tens, pp. 65-66

Equations, pp. 228, 230, 249

Inequations, p. 230

Odd and even numbers, p. 72

Roman numerals, I-C, pp. 56-57

Rounding

to nearest ten, p. 81

to nearest hundred, p. 92

to nearest thousand, p. 233

Estimating

using tens, pp. 84-85

using hundreds, p. 93

## Grade 2

### Number and Numeration *continued*

#### Decimals

tenths, pp. 238-239

#### Zero

concept, p. 2

## Grade 3

### Number and Numeration *continued*

#### Zero

in subtraction, pp. 74-75

in addition, pp. 12-13

in multiplication, p. 171

## Grade 4

### Number and Numeration *continued*

#### Fractions

concept of fraction ( $\frac{1}{2}$ ,  $\frac{1}{3}$ ,  $\frac{1}{4}$ ,  $\frac{1}{5}$ ,  $\frac{1}{6}$ ,  $\frac{1}{8}$ ,  $\frac{1}{10}$ ), pp. 129, 240

equivalent fractions ( $\frac{1}{2}$ ,  $\frac{1}{3}$ ,  $\frac{1}{4}$ ,  $\frac{1}{5}$ ,  $\frac{1}{10}$ ,  $\frac{1}{100}$ ), pp. 130, 134

comparing using  $<$ ,  $>$ ,  $=$  ( $\frac{1}{5}$ ,  $\frac{1}{10}$ ), p. 131

numerator, denominator, p. 129

fractions as 1 ( $\frac{3}{3}$ ,  $\frac{5}{5}$ ,  $\frac{8}{8}$ ,  $\frac{9}{9}$ ,  $\frac{10}{10}$ ,  $\frac{100}{100}$ ), pp. 134, 214-215

fractions greater than 1, p. 135

hundredths as fraction, p. 214

parts of a set, p. 241

writing fractions as decimals, pp. 238-239

#### Decimals

tenths, pp. 132-133

ones and tenths, pp. 135, 140, 145

hundredths, p. 215

units-hundredths, pp. 216-217

tens-hundredths, p. 218

thousands-hundredths, p. 219

comparing using  $<$ ,  $>$ ,  $=$  (ones, tenths), p. 146

comparing using money, p. 225

comparing (10 000 through 0.01), p. 226

rounding to nearest whole, p. 232

rounding large decimal numbers, p. 233

writing decimals for fraction numbers,  $\frac{1}{2}$ ,  $\frac{1}{5}$ , pp. 238-239

#### Zero

in addition, pp. 21-22

in subtraction, pp. 27-29

in multiplication, p. 64

in division, p. 123

## Grade 2

### Addition

#### Basic addition facts

facts to nine, pp. 25-26, 44, 69-72  
facts to eighteen, pp. 105, 109,  
137-141, 168-170, 173

Order property of addition,  
pp. 29-30, 137, 139, 168

Three addends, vertical column,  
pp. 135, 208

Checking addition, p. 152

#### Adding, no regrouping

tens, pp. 93, 158  
ones to tens and ones, pp. 95-96  
tens and ones, pp. 97-98  
hundreds, p. 161  
hundreds, tens, and ones  
pp. 162-163

Adding with regrouping  
tens and ones, pp. 213-216

Zero in addition, pp. 27-28

## Grade 3

### Addition

#### Basic addition facts

facts to nine, pp. 8-9  
facts to eighteen, pp. 12-13, 15,  
27, 38

Order property of addition, p. 10

Addends, sums, p. 15

Three addends, vertical column,  
pp. 30-31, 158

#### Adding, no regrouping

ones to tens and ones, pp. 17, 27,  
33-34, 38  
tens and ones, pp. 39-40  
hundreds, tens, and ones, p. 44

#### Regrouping

tens and ones, pp. 45-46  
hundreds, tens, and ones, p. 50

#### Adding with regrouping

tens and ones, pp. 47-49  
hundreds, tens, and ones, pp. 48,  
51-54, 76, 107-108, 143, 158, 247

#### Adding decimals

dollars and cents, p. 145  
ones and tenths, pp. 133, 135

Zero in addition, pp. 12-13

## Grade 4

### Addition

#### Whole numbers

sums to 18, p. 5,  
2 digits, no regrouping, p. 6  
2 digits, regrouping, p. 7  
3 addends, 1 digit in columns,  
p. 14  
4 addends, p. 15  
3 digits, no regrouping, p. 17  
3 digits, regrouping, p. 19  
3 and 4 digits, regrouping, p. 38  
5 digits, regrouping, p. 39  
6 digits, regrouping, p. 44  
3 addends, 3 and 4 digits,  
horizontal, p. 41  
3 and 4 addends, 3 and 4 digits,  
vertical, p. 231  
relating addition and subtraction,  
p. 26  
missing addends, p. 227  
estimating sums, p. 234

#### Fractions

fractions with common  
denominators, p. 236

#### Decimals

adding money, pp. 153-154, 156  
tenths, no regrouping, pp. 139,  
147  
tenths, regrouping, p. 141  
ones and tenths, regrouping, p. 148  
hundredths, no regrouping, p. 220  
addition with regrouping, p. 221

#### Properties

commutative property, p. 12  
associative property, p. 13



## Grade 2

### Subtraction

#### Basic subtraction facts

facts to nine, pp. 31-32, 37, 45, 75-77

facts to eighteen, pp. 107, 142-144, 174-176

Checking subtraction, pp. 153, 225

#### Subtracting, no regrouping

tens, pp. 99, 159

ones from tens and ones, pp. 100-101

tens and ones, pp. 102-103, 218

hundreds, p. 164

hundreds, tens, and ones, pp. 165-166

#### Subtracting with regrouping

tens and ones, pp. 219-224

#### Relating addition and

subtraction, pp. 38, 78-79, 108, 145-146, 177-178

#### Addition and subtraction

facts mixed

facts to nine, pp. 39, 41-42, 54, 82, 89, 91

facts to eighteen, pp. 240, 249

Zero in subtraction, pp. 33-34

## Grade 3

### Subtraction

#### Basic subtraction facts

facts to nine, pp. 23, 27

facts to eighteen, pp. 24, 55

#### Subtracting, no regrouping

ones from tens and ones, pp. 25, 27, 33-34, 55-56

tens and ones, p. 58

hundreds, tens, and ones, pp. 65-66

#### Regrouping for subtraction

tens and ones, p. 60

#### Subtraction with regrouping

ones from tens and ones, p. 61

tens and ones, pp. 62-63

hundreds, tens, and ones, pp. 67-68, 70-71, 75-76, 143, 158, 247

#### Related sentences, addition

and subtraction, p. 22

#### Subtracting decimals

dollars and cents, p. 146

ones and tenths, pp. 134-135

Zero in subtraction, p. 74

## Grade 4

### Subtraction

#### Whole numbers

differences to 18, p. 5

checking by adding, p. 26

2 digits, no regrouping, p. 21

2 digits, regrouping, p. 22

3 digits, no regrouping, p. 23

3 digits, regrouping, p. 24

4 digits, regrouping, p. 42

5 and 6 digits, regrouping, p. 43

relating addition and subtraction, p. 26

zeros in subtraction, regrouping, pp. 27-29

estimating differences, p. 235

#### Fractions

fractions with common denominators, p. 237

#### Decimals

ones and tenths, no regrouping, p. 147

ones and tenths, regrouping, pp. 143, 149

hundredths, no regrouping, p. 222

subtraction, regrouping, p. 223

subtracting money, pp. 154-157



## Grade 2

### Multiplication

Readiness for multiplication  
relating addition and  
multiplication, pp. 229-230  
introducing the  $\times$  sign,  
pp. 231-232

Order property in  
multiplication, p. 233

Zero and one in  
multiplication, pp. 234-235

Basic multiplication facts to  
 $5 \times 5$ , pp. 236, 244

## Grade 3

### Multiplication

Readiness for multiplication  
relating addition and  
multiplication, pp. 157, 159  
meaning of multiplication, p. 217

Basic multiplication facts  
multiplicands one through five,  
pp. 160-163, 165-166, 168-171,  
182, 184, 220-224, 232, 238, 265  
multiplicands six through nine,  
pp. 266-271, 278, 280, 285

Zero in multiplication, p. 171

Order property of  
multiplication, p. 173

Multiplication by ten and one  
hundred, pp. 225, 281-282

Associative property of  
multiplication, p. 279

## Grade 4

### Multiplication

Relating addition and  
multiplication, pp. 61-62

Relating multiplication and  
division, pp. 102-103

Factors and products, 1 digit  
 $\times$  1 digit, p. 63

Zero and one as factors, 1  
digit  $\times$  1 digit, p. 64

Multiples, pp. 65-66

Basic facts  
up to  $5 \times 10$  and  $10 \times 5$ , p. 69  
up to  $10 \times 10$ , pp. 76-77

Commutative property, pp. 67-68,  
73

Distributive property, pp. 74-75, 86

Associative property, p. 82

Multiplication by 1, 10, 100,  
1000, pp. 79-80, 83, 254

Estimate product, pp. 84-85, 90,  
93, 255

Partial products  
no regrouping, p. 87  
with regrouping, p. 88

Multiplication algorithm with  
regrouping  
 $2 \text{ digits} \times 1 \text{ digit}$ , pp. 89, 94-95  
 $3 \text{ digits} \times 1 \text{ digit}$ , pp. 91, 124  
 $2 \text{ digits} \times 2 \text{ digits}$ , pp. 252-253,  
265  
 $3 \text{ digits} \times 2 \text{ digits}$ , pp. 256-257

Missing factors, p. 246

3 factors, p. 273

Decimals, multiplication by 10,  
p. 250

## Grade 2

### Division

Readiness for division  
missing factor, p. 243  
introducing the  $\div$  sign in division  
by two, p. 245  
Basic division facts to product  
twenty, p. 246

## Grade 3

### Division

Readiness for division  
sharing, pp. 175, 217, 222  
relating multiplication and  
division, pp. 176, 218-219, 227,  
240  
repeated subtraction, p. 177  
Quotient, p. 178  
Basic division facts  
divisors one through five, pp. 178,  
181-182, 185, 227-232, 238  
divisors six through nine,  
pp. 272-276, 278, 285  
Related sentences, multiplication  
and division, pp. 179-180, 234-235  
Introducing the  $\overline{)}$  sign, p. 227  
Dividing by ten, pp. 233, 283  
Zero in division, p. 237  
Using the multiplication table  
for division, pp. 236, 284  
Remainders in division,  
pp. 290-291

## Grade 4

### Division

Meaning of division, p. 101  
Related sentences ( $\times$ ,  $\div$ ),  
pp. 102-103  
Dividing 1- and 2-digit numbers,  
by 2, 3, 4, 5, pp. 104-105  
by 6, 7, p. 108  
by 8, 9, p. 109  
Division by 10, 100, 1000, p. 122  
One in division, p. 106  
Dividing by powers of ten, pp. 107,  
254  
Division with remainders  
(problem form), pp. 112-114  
Dividing powers of ten by  
1-digit divisor, p. 115  
Estimate quotient to nearest  
10 using 3-digit divisor, p. 116  
Dividing 3 digits by 1 digit,  
no remainder, p. 117  
Dividing 3 digits by 1 digit,  
with remainders, pp. 119, 258-259  
Checking division, no  
remainder, p. 118  
Short form  
3 digits by 1 digit, pp. 120-121,  
260  
4 digits by 1 digit, pp. 261-262  
Zero in division, p. 123  
Finding average, pp. 164-165  
Missing divisors and dividends,  
p. 247  
Rules for divisibility, 2-6, p. 264  
Decimals, division by 10, p. 251

## **Grade 2**

### **Geometry**

Recognizing shapes, pp. 183-186, 188  
triangles, p. 183  
rectangles, p. 184  
squares, p. 185  
circles, p. 186  
Solids, p. 188  
Edges, faces, corners, pp. 189-190  
Inside, outside, on, p. 187  
Line segment, p. 182  
Patterns, p. 191  
Similarity, p. 192  
Symmetry, pp. 193-194

## **Grade 3**

### **Geometry**

Recognizing 3-D shapes, pp. 81-82,  
85-87, 89, 92, 94  
Sorting, pp. 96-97  
Drawing shapes, pp. 86, 88-89, 93  
Making 3D shapes, p. 84  
Counting faces, p. 83  
Classifying triangles, p. 87  
Segments, rays, lines, p. 246  
Angles, pp. 248-249  
Similarity, p. 95  
Symmetry, pp. 90-91, 93  
Open and closed curves, p. 245  
Circles, p. 93  
Slides, pp. 250-251

## **Grade 4**

### **Geometry**

Recognizing and sorting  
solids, pp. 192, 197, 199  
Rectangles, squares, p. 188  
Skeletal models of cube,  
pyramid, and prism, p. 191  
Solid models, pp. 185-186, 189-190,  
194-195  
Cross sections of solids, p. 200  
Classifying solids, p. 198  
Spheres, p. 196  
Classifying triangles, p. 309  
Line segments, p. 187  
Intersecting and parallel  
lines, pp. 306-307  
Segments, rays, angles, p. 308  
Right angles, p. 193  
Congruence, pp. 187, 310-311  
Symmetry, p. 318  
Circles, p. 305  
Slides, pp. 312-313  
Turns, pp. 314-316  
Flips, p. 321

## Grade 2

### Measurement

#### Time

hour, half hour, 5, pp. 63-67  
calendar, days of week, p. 73

#### Money

penny, nickel, dime, quarter,  
dollar, pp. 125-126, 129, 131  
making change, p. 226

Nonstandard units, pp. 196, 201, 205

Longer than, shorter than, p. 195

#### Metric

centimetre, metre, pp. 197-200  
litre, pp. 202-203  
kilogram, pp. 206-207

Temperature, p. 204

## Grade 3

### Measurement

#### Time

1 min intervals, pp. 206-208  
minute after, before, pp. 210-211  
days, months, calendar, p. 203

#### Money

dollars and cents, pp. 144-148  
making change, pp. 151-152  
adding dollars and cents,  
pp. 145, 247  
subtracting dollars and cents,  
pp. 146, 247

Heavier, lighter, pp. 121, 140

#### Metric

centimetre, metre, decimetre,  
kilometre, pp. 37, 59, 69, 109,  
111-113, 116, 189  
litre, millilitre, pp. 137-138, 200  
kilogram, gram, pp. 118-119, 201  
changing metres to decimetres,  
p. 113  
using appropriate unit, p. 153

Temperature, p. 204

Rounding to nearest whole,  
pp. 110-120

Estimation, pp. 114-115, 121, 201

Perimeter, pp. 190-191

Area, pp. 192-195

Volume, pp. 196-199

## Grade 4

### Measurement

#### Time

24 h clock, p. 298  
seconds, hours, pp. 299-300  
days, weeks, months, years, p. 300  
decimal notation, p. 151

#### Money

making change to \$10, p. 152  
adding dollars and cents,  
pp. 153-154  
subtracting dollars and cents,  
p. 155

#### Metric

centimetre, metre, decimetre,  
kilometre, millimetre, pp. 48-51,  
136-138  
millilitre, p. 174  
kilogram, gram, p. 175  
changing units within a measure,  
pp. 52, 175  
choosing a unit, pp. 54, 176, 266

Temperature, pp. 292-294

Rounding, p. 166

Estimation, pp. 47, 177, 272

Perimeter, p. 171

Area, pp. 267-272

nonstandard unit, p. 267  
square centimetre, p. 268  
area of rectangle, p. 269  
square metre, p. 271  
estimating area, p. 272

#### Volume

nonstandard units, p. 274  
cubic centimetre, p. 276  
cubic metre, p. 277  
calculating, p. 275



## Grade 2

### Problem Solving

- Choosing an addition sentence to go with a problem, p. 35
- Choosing a subtraction sentence to go with a problem, p. 36
- Deciding whether to add or subtract, pp. 40, 62, 80
- Mini-problems, addition and subtraction, pp. 46, 81, 90, 104, 154, 171, 222
- Word problems, addition and subtraction, pp. 106, 111, 134, 147, 150-151, 167, 179
- Problems involving money, pp. 127-128, 130, 132, 148

## Grade 3

### Problem Solving

- Using addition to interpret a pictured problem, p. 8
- Using subtraction to interpret a pictured problem, p. 21
- Using fractions and decimals to interpret a pictured problem, p. 136
- Word problems, addition, pp. 14, 16, 31, 49, 77, 108
- Word problems, subtraction, pp. 26, 28-29, 57, 64, 77
- Problems involving measurement, pp. 69, 117, 139, 141, 252
- Problems with extraneous information, p. 142
- Problems involving money, pp. 147, 149-150, 252, 261
- Problems involving time, pp. 212-213
- Word problems, multiplication, pp. 174, 183, 205, 226, 239, 241, 287, 289
- Word problems, division, pp. 183, 205, 222, 239, 241, 277, 287, 289
- Choosing a number sentence to fit a problem, p. 202
- Writing a number sentence to fit a problem, p. 209
- Interpreting information in a chart or graph, pp. 253-261

## Grade 4

### Problem Solving

- How to read math problems, pp. 8, 10-11
- Addition and subtraction whole numbers, pp. 11, 25, 40, 45, 53-54  
decimals, pp. 228, 235
- Multiplication and division whole numbers, pp. 70-71, 90, 97, 107, 111-112, 122, 162-163, 248-249, 263
- Time and distance, p. 170
- Capacity, p. 173
- Temperature, p. 295
- Area and volume, pp. 270-271, 296
- Money, change, p. 152  
addition and subtraction, pp. 156-157
- Time line, p. 301
- Drawing pictures to solve problems, p. 179
- Two-step problems, pp. 180-181
- Solving from a paragraph, p. 178
- Estimating to solve, pp. 84-85, 90, 93
- Writing number sentences, pp. 53, 228, 249
- Writing problems to fit number sentences, p. 229
- Using charts, problems with many questions, pp. 178, 201
- Too little information, p. 172
- Interpreting charts, graphs, pp. 281-292

## **Grade 2**

### **Graphing**

Picture graph, pp. 19-20  
Bar graph, pp. 21-22, 172  
Reading graphs, p. 61

### **Careers**

Salesperson, p. 9  
Painters, p. 18  
Mechanics, p. 62  
Day care centre workers, p. 80  
Animal doctors, p. 111  
Repair shop worker, p. 134  
Music shop worker, p. 147  
Pilots and copilots, p. 171  
Forest rangers, p. 208  
Firefighters, p. 222

## **Grade 3**

### **Graphing**

Tally marks, pp. 254-255  
Picture graph, pp. 256-257  
Bar graph, pp. 258-260, 265  
Schedules, p. 213

### **Careers**

Conservation officer, p. 29  
Post office clerk, p. 49  
Baker, p. 64  
Flower shop clerk, p. 77  
Grocery store clerk, p. 92  
Carpenter, p. 117  
Coffee shop worker, p. 136  
Fruit farmer, p. 141  
Animal trainer, p. 183  
Pet shop clerk, p. 205  
Factory workers, p. 241  
Carnival workers, p. 261  
Doctor, p. 289

## **Grade 4**

### **Graphing**

Tally charts, p. 206  
Pictographs, pp. 204-209  
Bar graphs, pp. 281-289  
Reading charts, pp. 201-202  
Line graph, pp. 290-291  
Reading a city map, pp. 322-323  
Using a map, pp. 51, 168-169  
Ordered pairs, pp. 322-325  
Scale drawing, pp. 167-169

### **Careers**

Flight attendant, p. 25  
Manufacturing plant worker,  
p. 54  
Sports shop owner, p. 97  
Grocery store clerk, p. 111  
Hamburger stand operator,  
p. 157  
Gas station owner, p. 163  
Post office worker, p. 209  
Engineer, p. 235  
Construction worker, p. 256  
Librarian, p. 301  
City designer, p. 322

# TEACHER'S COMMENTARY

## THE HOLT MATHEMATICS SYSTEM

Two fundamental premises which underlie an effective learning system are:

1. Motivation is an important prerequisite to learning.
2. Each student may require a different motivational technique.

The HOLT MATHEMATICS SYSTEM (HMS) was developed to incorporate these premises. The various components of HMS provide a variety of motivational and instructional devices with which to reach students.

Teachers can present opportunities for learning through a medium best suited to the particular abilities and learning style of the individual student. The components of HMS are:

### Readiness

Student's Book  
Teacher's Edition

### Grade 1

Student's Book  
Teacher's Edition  
BFA Computational Skills Kit I

### Grade 2

Student's Book  
Teacher's Edition  
BFA Computational Skills Kit I  
BFA Math Problem Solving I

### Grade 3

Student's Book  
Teacher's Edition  
BFA Computational Skills Kit I  
BFA Math Problem Solving I  
Duplicating Masters

### Grade 4

Student's Book  
Teacher's Edition  
BFA Computational Skills Kit II  
BFA Math Problem Solving II  
Duplicating Masters  
Calculator Workbook

### Grade 5

Student's Book  
Teacher's Edition  
BFA Computational Skills Kit II  
BFA Math Problem Solving II  
Duplicating Masters  
Calculator Workbook

### Grade 6

Student's Book  
Teacher's Edition  
BFA Computational Skills Kit II  
BFA Math Problem Solving II  
Duplicating Masters  
Calculator Workbook

## TEACHING STRATEGIES

There is no one best way to teach mathematics to all students. Therefore, the HOLT MATHEMATICS SYSTEM is adaptable to many teaching styles.

Four different ways in which the program can be taught are:

- Teach the whole class together; have all students work on the same material at the same time, with the same written assignments.
- Teach the whole class together; have all students work on the same material at the same time, but differentiate the written assignments.
- Group the children and teach each group separately; each group may be doing different lessons on the same day.
- Use a continuous progress approach, letting each student progress at his or her own rate; every student could be working on a different lesson on any particular day. Suggestions in the *Teacher's Edition* provide assistance in differentiating the assignments.

## THE STUDENT'S BOOK

### Language

While it is important to teach students to become better readers, even within the framework of mathematics instruction, a deficiency in reading should not stand in the way of learning mathematics. The language used in the *Student's books* is uncomplicated and concepts are presented by means of illustrations or examples rather than by long verbal explanations.

Clear, concise titles, which appear at the top of every lesson, serve as a general description of content. A further note outlining the specific page object and subject matter is included at the bottom of every page.

### Content

The major primary grade concepts which appear throughout HMS are as follows:

Number and Numeration  
Operations and Properties  
Sentences  
Problem Solving and Application  
Geometry  
Measurement  
Graphs, Tables

Since students do not fully master any concept on the first encounter, this program of studies is presented in three stages:

- 1st — a thorough introduction
- 2nd — reinforcement and mastery
- 3rd — maintenance and extension.

Understanding is consistently reinforced as students bring their growing knowledge and maturity to bear upon more abstract concepts and more difficult skills.



## Developmental Aspects of Lessons

The HOLT MATHEMATICS SYSTEM is “developmental” in that each lesson is sequenced to proceed from an initial activity, through a learning stage, and finally to practice exercises. This lesson style (**display**, **development**, and **drill**) was adopted to give children an understanding of the concepts in the lessons through active participation in the development of the concepts or skills, followed by practice in the use of these concepts.

Each lesson follows a definite pattern: (1) **display** — an *initial activity* where hands-on materials such as blocks are used to teach the concept; the initial activity appears in the side column of the *Teacher's Edition* for every lesson. (2) **development** — a *learning stage* which uses pictures and other visual hints to develop the concept; the learning stage is the first part of the Exercises where the child is guided, through the use of coloured numerals or other hints, to the pattern of response. To provide immediate reinforcement, the answer to some of the developmental items, indicated by circles, are placed in the back of the *Student's book*. (3) **drill** — *exercises* which drill the concept or skill presented in the display; the exercises are the items which the children do individually to demonstrate understanding.

## Basic Skills

HMS embodies the philosophy that it is important for the student to develop a concept or skill meaningfully. However, a meaningful development needs to be followed by practice. To become a proficient user of mathematics one has to practise the skills that have been acquired. Accordingly, ample practice is provided to diagnose areas of difficulty and to maintain skills.

Throughout the program, a large number of computational exercises are presented with over 4000 in each book, Grades 2 to 6. Additional exercises may be found in the other HMS components.

Exercises which extend the developmental items presented in the lesson are starred. Additional challenges are provided by the **Braintickers** which appear throughout the book.

HMS repeatedly asks students to discover patterns. These experiences are intended to help build a sense of relationship between numbers and to develop self-reliance when a problem is tackled. Discovering patterns is an enjoyable activity since it is usually accompanied by a sense of anticipation.

## Diagnosing

Diagnostic materials appear throughout HMS in a variety of formats. The **Basic Skills Check Ups**, which are part of HMS from Readiness to Grade 6, provide experience in the type of format that is often used on standardized tests.

**Cumulative Reviews** in Grades 3 to 6 enable the teacher to pinpoint areas of the child's achievement or deficiency prior to studying other concepts in the text. Based on the results, one can determine what combination of learning experiences will best help each child.

All **Check Ups** and **Cumulative Reviews** are keyed in the *Teacher's Edition* to the pages on which the skills were presented.

The **Chapter Test** at the end of each chapter can also be used diagnostically. Each exercise in the test is referenced to a specific objective which is stated in the *Teacher's Edition*. This provision enables the teacher to review specific concepts and skills needing improvement.

## Maintaining Skills

Keeping acquired skills sharp is important to HMS. Maintenance pages therefore appear regularly throughout the pupil books. **Keeping Fit** (Grades 1 and 2) and **Tune Up** (Grades 3 to 6) are mixed frequently with stimulating **Practice** pages to help reinforce specific facts and concepts.

At the end of each book are collected additional practice exercises, keyed to the appropriate pages in the *Student's book*.

Additional and supplementary practice material in the form of duplicating masters, computational and problem solving skills kits, and a calculator workbook are also available and are keyed to the program.

## Testing

A complete testing program for monitoring students' progress is provided within HMS. **Chapter Tests** (called “Think” in Grades 1 and 2) at the end of each chapter are designed to help evaluate the extent of mastery of the essential chapter content. In the *Teacher's Edition*, test items are referenced to specific objectives which are listed for each chapter. An invaluable measuring device, the **Chapter Tests** allow teachers to diagnose the particular strengths and weaknesses of each student.

Additional test materials and supplementary tests are available in the form of *duplicating masters* (Grades 3 to 6).

## Measurement

The measurement section in HMS is completely SI metric. The strand features a “hands-on” approach to measurement augmented by written exercises which further broaden and reinforce the concepts.

Often a page of nonstandard, informal units of measure will help introduce the activities and exercises developing the established measurement system.



## Problem Solving

Solving problems is one of the major strands in HMS. We start problem solving early and use it as a tool for reinforcing basic facts.

The development of problem-solving skills is very gradual. It is based essentially on (1) interpreting action pictures, (2) joining and separating sets of objects, and (3) solving word problems.

Word problems are first presented in the form of mini-problems which contain only those words which are necessary for an understanding of the problems.

The challenge of providing children with an opportunity to grow systematically in the ability to solve problems is met by incorporating word problems into many of the lessons throughout the program.

The problem-solving skills developed in Grade 3 are:

- reading word problems
- choosing a number sentence to fit a word problem
- writing number sentences
- estimating the answer
- recognizing extraneous information
- reading information from tables or graphs
- choosing the correct operation
- solving word problems related to careers

In addition to this rich and systematic program of developing problem-solving skills, HMS includes a lesson on problem solving related to a selected career in each chapter. This career strand is of considerable importance to this program and is therefore discussed in detail.

## Career Strand

Making children aware of existing careers makes mathematics learning relevant, realistic, and motivational.

Specifically, the purpose of the HMS career strand is twofold:

- To stimulate career awareness in children by presenting them with problems which deal with situations related to various careers, and
- To provide teachers with the essential information about various careers.

Appropriate learning experiences or activities are provided in the *Teacher's Edition* for lessons dealing with careers. These lessons are adapted to the developmental level of the child.

The careers are chosen to focus on certain specific objectives:

- To help the child develop an awareness of physical skills
- To develop an awareness of self and others
- To help students develop self-reliance
- To develop an awareness of a multitude of careers
- To develop social awareness

Each chapter highlights one or more specific careers and provides the opportunity to discuss others.

## Activity Pages

Interspersed throughout the texts are **activity** pages.

**Activity** pages provide motivation and active participation on the part of the child. Concepts are developed or practised through the use of activities.

## Chapter Themes

In an effort to motivate children and to interrelate mathematics to other subject areas, some chapters in these books are oriented toward certain themes. For example, the theme of a chapter may pertain exclusively to transportation, fairy tales, the sea, the farm, the community, the circus, foreign lands, and others. The illustrations in these chapters emphasize the theme of the chapter. These themes are identified in the **Chapter Overviews**.

## THE TEACHER'S EDITION

The *Teacher's Edition* is the key to using HMS. All references to components of this program, as they apply to each lesson, are provided literally at one's fingertips. With this type of manual, the teacher can easily direct children to other practice materials, guide them to activities, and provide them with projects that will extend their mathematical horizons.

The layout for each individual lesson contains a reduced version of the pupil page with answers superimposed. Surrounding this are the related lesson commentaries closely positioned to allow quick and easy access.

## Front of Teacher's Edition

A **Scope and Sequence** chart displays three years of topics and the extent to which they are presented in HMS. Using the chart, it is easy to tell, at a glance, where any particular lesson falls in the flow and scheme of the whole Mathematics System.

An **Activity Reservoir** section, consisting of mathematical games and activities, provides a framework for enjoyable practice work throughout the year. These games and activities are keyed into individual lessons, but each may be adapted and used at the discretion of the teacher.

A **Problem of the Week** section consists of challenging mathematical puzzles and problems. These are for additional motivation. They can be offered to children via the bulletin board or a special problem box.

A **Cumulative Test Item Bank** is supplied for the evaluation of the children's achievement with respect to part or all of the entire year's work. Pupil edition page references which are located along the margins of this section, allow the teacher to select items which test the appropriate desired objective. This format also allows the teacher to test on a regular basis or periodically spot check, as the particular situation may require.

## Chapter Overview

**Chapter Overviews** are appropriately interleaved before each chapter. Each overview consists of the following parts:

An **Introduction** explains what content is to be studied in the chapter.

**Objectives** for the chapter are stated in behavioural terms.

**Background** provides a meaningful setting for the mathematical concepts and skills taught in the chapter.

**Materials** lists the materials that are suggested for use in teaching the lessons.

**Career Awareness** describes the career to be studied in that chapter and provides background information for discussion. When necessary a caption is given for the photograph illustrating the career (Grades 1 and 2).

## Lesson Commentaries

Daily lesson commentaries generally provide varied approaches to teaching the lessons. Each lesson commentary, in the side columns of the *Teacher's Edition*, contains the following categories:

**Objectives** for each lesson are stated in behavioural terms. These objectives state very specifically what a child ought to be able to do at the end of the lesson.

**Pacing** suggestions are provided for some lessons to indicate how assignments may be differentiated.

Level A: a minimum course

Level B: an average course

Level C: an extended course

**Vocabulary** lists new words and terms introduced in the lesson.

**Materials** lists teaching aids helpful for teaching the lesson.

**Related Aids** keys the appropriate supplementary components of the program to the particular lesson.

**Background** provides a meaningful setting for mathematical concepts on which the lesson is based.

**Suggestions** usually provide readiness-type learning experiences which encourage children's involvement. This section contains the **Initial Activity** comments that should be completed before using the pupil page.

**Using the Book** provides specific teaching instructions for the lesson.

**Activities** provide varied learning experiences such as mathematical games, research projects, experiments, and so on that represent additional practice enrichment or extension.

**Extra Practice** supplies additional exercises which are appropriate to the content of the particular page. The assignment of these **Extra Practice** exercises, whether they be used orally as review preceding the next page, placed on cards or chalkboards as remedial exercises or perhaps for fast finishers, is of course left up to the discretion of the teacher.

## SUPPLEMENTARY MATERIALS

*Duplicating Masters* provide extra practice for selected lessons, graph paper, dot paper, cutouts for activities, nets for geometry and additional chapter tests.

*BFA Computational Skills Kit I* provides a diagnostic/prescriptive program for both instruction and practice. Simple placement tests help identify each child's level.

*BFA Math Problem Solving I* offers instruction and practice in solving math story problems. The kit is organized into five sections: Addition/Subtraction; Multiplication/Division; Application; Review; Enrichment.



# ACTIVITY RESERVOIR

## THE RECTANGLE GAME

**Use:** To conserve area  
To develop area of rectangles  
To build concept of factors, multiples, odds and evens, prime and composite numbers

**Materials:** Box of small 5 cm  $\times$  5 cm squares (or tiles)

**Players:** Two

**The Game:** Two players take the same number of tiles. Each makes and records the sizes of as many rectangles using that number of tiles; i.e., with 20 tiles:

$$1 \times 20$$

$$2 \times 10$$

$$4 \times 5 \text{ (3 rectangles)}$$

The winner is the player with the most rectangles after 5 different sets of tiles.

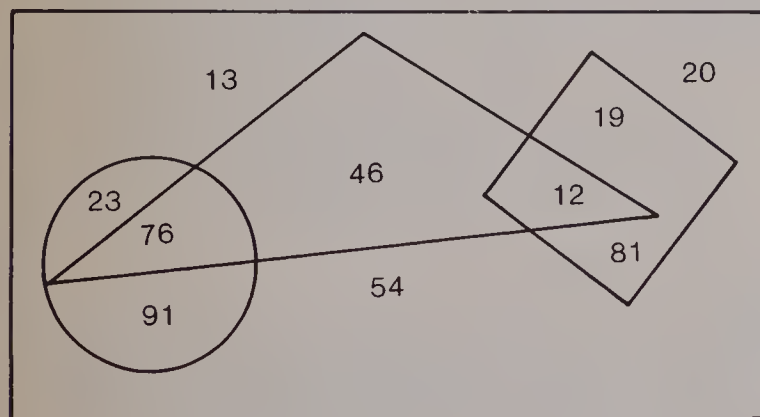
## NUMBER IN SHAPES

**Use:** To practise addition and subtraction  
To develop concept of intersection and union  
To practise recognition of geometric shapes

**Materials:** A game board made of heavy cardboard, a set of instruction cards for sum and difference. (The shapes and numbers should reflect the children's level of development.) A sample board is shown with sample cards.

**Players:** Any number

**The Game:** This can be used as an assignment card as well as a game. Each player takes turns drawing a card and finding the answer. The student with the most correct answers after 5 (or 10) draws is the winner.



Easy

Find the sum of the numbers in the triangle.

Find the sum of the numbers in the square.

Medium

Find the sum of the numbers in the triangle and circle.

Find the sum of the numbers in the circle and square.

Medium

Find the difference between the circle and square.

Find the difference between the square and triangle.

Hard

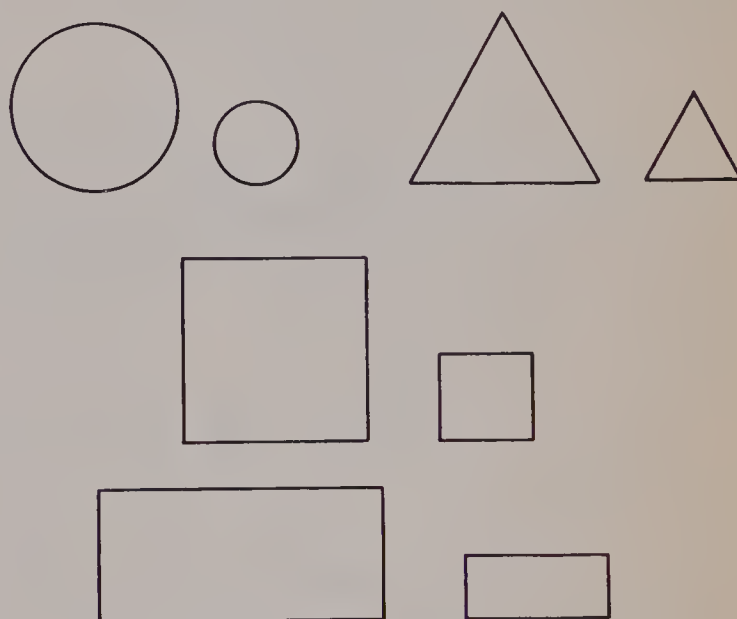
Sum of the numbers in the circle *but* not in the triangle.

Sum of the numbers in the triangle *but* not in the circle.

## THE SHAPE GAME

**Use:** To develop ability to use multiple attributes  
To develop logic and reasoning using geometric shapes

**Materials:** Set of shapes and playing board



Two of each size in red, blue, and yellow. A game board consisting of a grid of 4  $\times$  4 squares suitable for the shapes to fit on.



**Players:** Two to four

**The Game:** Divide the shapes evenly, randomly among the players. First player places a shape in a square. Each subsequent player must place a shape in a square next to one that is occupied so that the shapes in any two adjacent squares differ in one (later two, then three) way(s). (Later, adjacent can mean adjacent diagonal squares also.)

The winner is the player who plays the last shape.

## SHUFFLE NUMBERS

**Use:** To practise addition (or subtraction).

**Materials:** Game board made of heavy cardboard and a bottle cap. Place numbers on the board that are suitable for the lessons being reinforced.

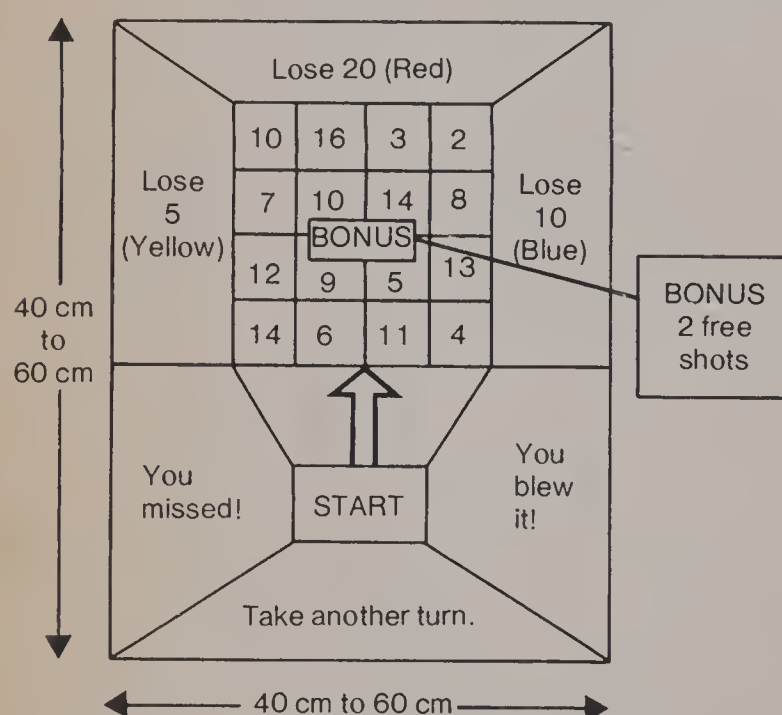
**Players:** Two to four

**The Game:** Put the bottle cap in the start box and push it or flick it with a finger. Add to your score the largest number in the square that it touches when it stops. The winner is the first to reach *exactly* 100. (Most students will need a pencil and paper to keep track.)

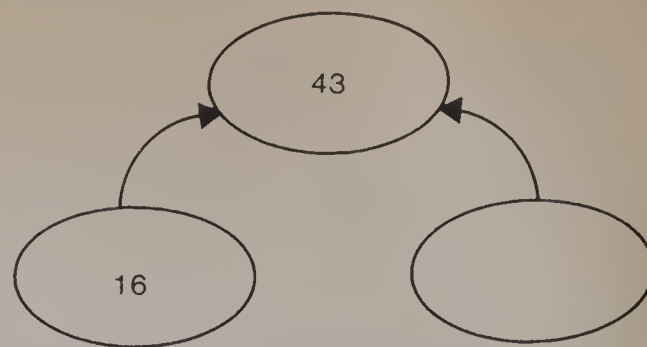
**Variations:** 1. Add all the numbers in the squares the cap touches when it stops.

2. Start with 100 and subtract instead of adding. First player to reach 0 *exactly* is the winner. (Lose areas mean to ADD now.)

3. Multiply each largest number by 2 before adding to the score.



**The Game:** First player places two numerals in two of the loops to indicate an operation; i.e.,



The second student has *two* chances to guess what number is needed to complete the operation. Example: 27 (since  $16 + 27 = 43$ ). The guess is correct. If the guess is incorrect the player has one more chance. The players then change roles. The player with the most correct answers after 10 turns is the winner.

## SHAPE PICTURES

**Use:** To practise number facts, fractions, and decimals To practise adding money

**Materials:** 5 of each of the basic shapes of varying sizes and shapes: triangles, rectangles, squares, circles. Suitable numbers are printed on each shape.

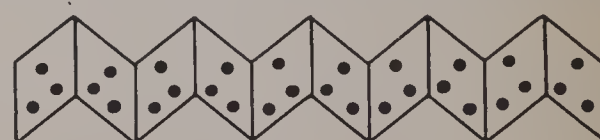
**Players:** Two or more

**The Game:** Each player is dealt the shapes in random order. Each player makes a picture using the shapes similar to those made with tangrams. The student with the greatest sum is the winner.

## THE MULTIPLICATION GAME

**Use:** To practise basic multiplication (and division) facts

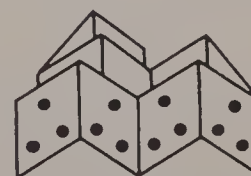
**Materials:** 10 strips of heavy paper folded into 10 parts and marked with dots for each multiplication fact family



The "Three" family.

**Players:** Two

**The Game:** A player selects a strip from the set that is face down on the table. The player folds the strip to show a multiplication fact to the other player.

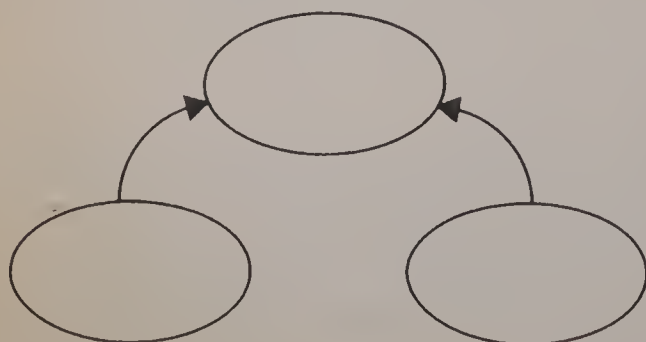


The other player must write the multiplication fact shown:  $4 \times 3 = 12$ . The players reverse roles. The player with the most correct responses after 10 plays each is the winner.

## MISSING NUMBERS

**Use:** To practise finding the missing component in a number sentence (or fact) using addition, subtraction, multiplication, and division

**Materials:** Duplicated sheets of this pattern



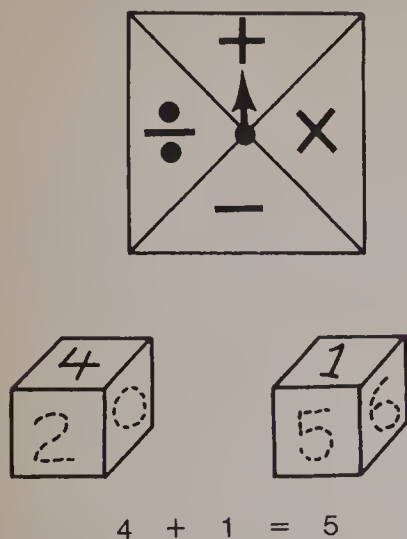
**Players:** Two



## THE FACTS MACHINE

**Use:** To practise the basic facts

**Materials:** 2 dice numbered 0 to 10 with two of one number (9's), a "facts machine" spinner



**Players:** Two or more

**The Game:** Each player takes turns spinning the facts machine and rolling the dice. The player then writes the correct number fact (where possible — since  $7 \div 3$  is not yet possible) using the operation the spinner points to and the two numbers on the tops of the dice. An answer sheet for each operation may be available for constant and immediate checking if necessary. The student with the most correct number facts after a given number of plays is the winner.

## NUMBERS GAME

**Use:** To compare two- (three-) digit numbers  
To practise multiplication

**Materials:** 20 numeral cards each of green, yellow (and blue)

**Players:** Two

**The Game:** Provide two students with 40 numeral cards, 20 green and 20 yellow. Each set contains 2 cards numbered 0 through 9. The yellow-numbered cards are "tens" and the green are "ones". Each student takes turns drawing from the decks, one yellow and one green card. The student whose number is greatest wins the cards. The player with the most cards at the end of the game is the winner.

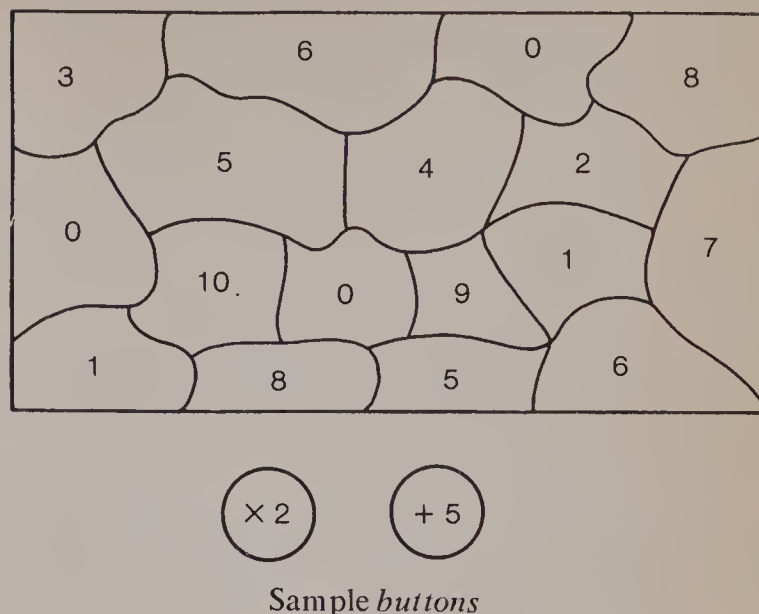
**Variations:** 1. Include the blue cards to extend to the hundreds.

2. For multiplication of multiples of tens by unit numbers, the player multiplies the numbers on the cards to get a score; i.e., if the student drew a yellow 4 and a green 5 the score would be  $40 \times 5 = 200$ .

## PATCHWORK QUILT

**Use:** To practise basic facts

**Materials:** A playing board made from heavy or construction cardboard, several *buttons* which are labelled for the appropriate skill to be practised



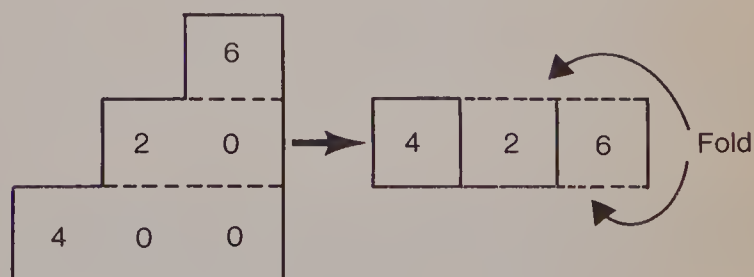
**Players:** Two to four

**The Game:** Each player takes turns throwing a *button* on the *quilt*. The player must write the correct number sentence. The player with the most correct sentences after a given number of throws is the winner.

## PLACE-VALUE GAME

**Use:** To practise writing numbers in standard and expanded form

**Materials:** A series of flip cards appropriate to the student's level, as illustrated. Label both sides of the middle section.



**Players:** Two or more

**The Game:** Each player picks an open flip card. The player writes the standard form of the number illustrated. The response is checked by folding the flip card. The player with the most correct is the winner.

**Alternate:** Player selects a folded flip card and must write the expanded form of the number. The response is checked by opening the flip card.

# METRIC BINGO

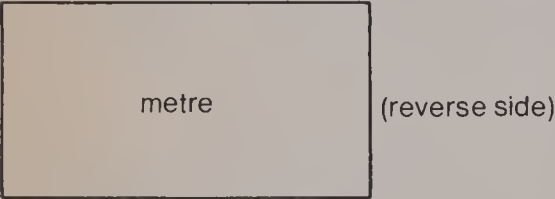
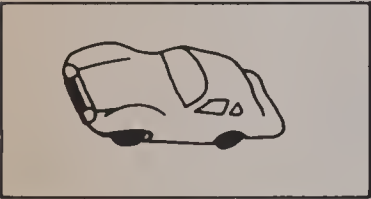
**Use:** To practise where various metric units are most appropriately used in measuring

**Materials:** A playing card with nine squares for each player. Each card is labelled differently. A set of 24 cards with a picture of a different object on each. On the back of each card is the most appropriate unit for measuring the object. Markers.

Sample of playing card:

|            |          |            |
|------------|----------|------------|
| metre      | litre    | kilometre  |
| gram       | FREE     | centimetre |
| millilitre | kilogram | millimetre |

Sample card:



**Players:** Any number

**The Game:** Each player takes a turn picking a card. The player states which metric unit is most appropriate to measure the object illustrated. The answer is checked by looking at the back of the card. If the response is correct, a marker is put on the corresponding square of the player's playing card. The first player to get three markers in a row is the winner.

# SORTING GAME

**Use:** To practise sorting and naming the rule for a sorting

**Materials:** A set of 10 objects (changed monthly) which would lend themselves to being sorted; i.e., a set of buttons of different colours, sizes, and shapes; cans; boxes; polygons; leaves. Later you can have a general set of items.

**Players:** Two to four

**The Game:** One player sorts the objects according to a rule (kept in this player's mind). The active player tries to identify the rule. The one who guesses the rule gets to sort the next time. The person who guesses the most rules after 12 sortings is the winner.

**Alternate:** Players take turns sorting (so everyone gets to sort).

*Hint:* 1. Get the students to sort according to a simple rule: "One set has the property, the other set does not, as in "this set of buttons is red, the other set of buttons is not red."

2. Later, the students can use two descriptors to sort: this set of buttons is round and red, the other set of buttons is not round and red."

# PROBLEMS OF THE WEEK

1. These are some addition questions written in a secret code. Change each letter into a number to break the code. Each letter stands for only one number in each addition problem. The sum must be right. (Answers will vary. Here are some samples.)

$$\begin{array}{r} \text{two} \\ + \text{two} \\ \hline \text{four} \end{array}$$

o = 4, r = 8, w = 3,  
u = 6, t = 7, f = 1

$$\begin{array}{r} \text{t} \\ \text{r} \\ + \text{y} \\ \hline \text{it} \end{array}$$

t = 5, r = 6,  
y = 4, i = 1

$$\begin{array}{r} \text{i s} \\ + \text{i t} \\ \hline \text{f u n} \end{array}$$

s = 2, t = 3, n = 5,  
i = 8, u = 6, f = 1

$$\begin{array}{r} \text{p e r} \\ + \text{f e c t} \\ \hline \text{w o r k} \end{array}$$

r = 1, t = 2, k = 3,  
e = 4, c = 7, p = 5,  
o = 0, f = 8, w = 9

2. Find the pattern and write the next four numbers.

5, 8, 7, 10, 9, ■, ■, ■, ■

(Add 3, then subtract 1; 12, 11, 14, 13.)

3. I am thinking of a two-digit number. If I switch the digits, the number is the same. How many numbers are there like this between 10 and 100?

(9 numbers: 11, 22, 33, 44, 55, 66, 77, 88, 99)

4. "How much change?"

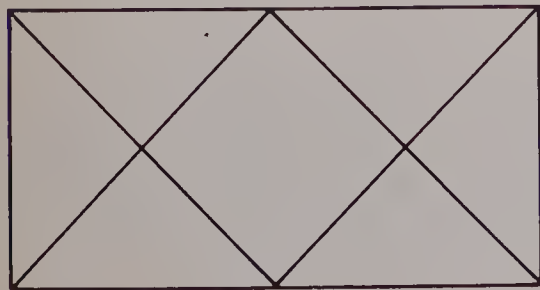
A boy buys a Yo-yo costing 69¢ and gives the clerk \$1.00. How many different ways (using different coins) could he get his change? (Answers will vary.)

5. Find the pattern and write the next four numbers.

1, 2, 4, 8, 16, ■, ■, ■, ■

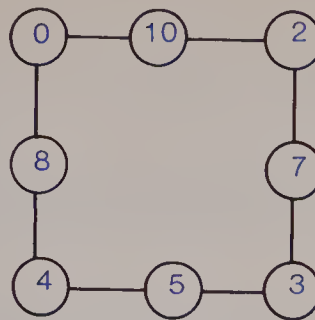
(Add each number to itself; 32, 64, 128, 256.)

6. How many triangles can you find in this window? (12)



7. Use some of the following numbers to make each side of the square add up to 12. You can only use a number once.

0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10



(Answers will vary. One answer is given.)

8. I am thinking of a number. I multiply it by 3. Then I add 1. The answer is 22. What is the mystery number? (7)

9. Find the pattern and write the next four numbers.

10, 15, 12, 17, 14, ■, ■, ■, ■

(Add 5, then subtract 3; 19, 16, 21, 18.)

10. Set up a number code to match the letters of the alphabet.

(E.g., a = 1, b = 2, etc.)

Write the names of different pupils in number code each week and see if the children can write the names of the mystery pupils. The code can be varied to use different values and patterns.

11. Assign a number value to each letter of the alphabet (a = 1, b = 2, etc.).

Have the children find the number value of their name.

E.g.,

$$\begin{array}{c} \text{T} \\ \downarrow \\ 20 \end{array} + \begin{array}{c} \text{O} \\ \downarrow \\ 15 \end{array} + \begin{array}{c} \text{M} \\ \downarrow \\ 13 \end{array} = \textcircled{48}$$

This could be extended to include surnames as well.

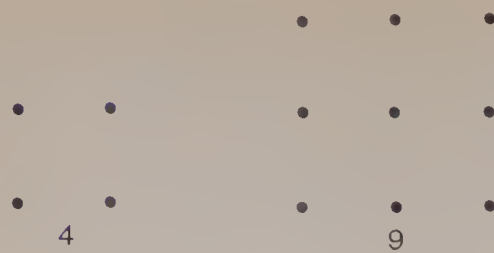
12. I am thinking of a two-digit number. If I reverse the digits and add this number to the original number, I get a twin number as the answer. How many more twin numbers can you make?

$$\begin{array}{r} 12 \\ + 21 \\ \hline 33 \end{array} \quad \begin{array}{r} 23 \\ + 32 \\ \hline 55 \end{array} \quad \begin{array}{r} 34 \\ + 43 \\ \hline 77 \end{array} \quad \text{etc.}$$

13. How many fingers and toes are there in your classroom?



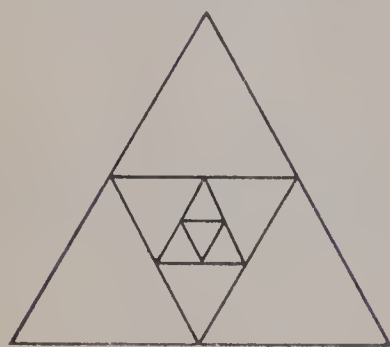
14. Make the next three square arrays. Write these numbers. (16, 25, 36)



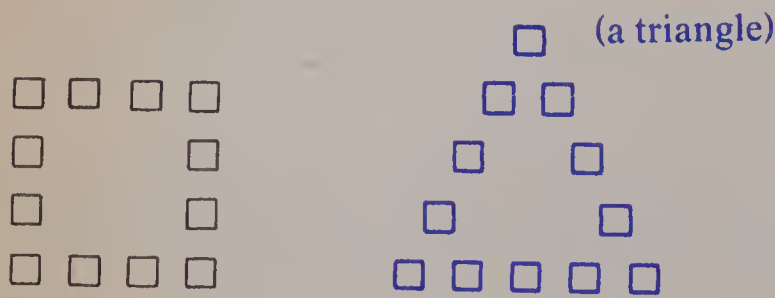
15. Make the next three triangular arrays. Write these numbers. (10, 15, 21)



16. How many equilateral triangles? (13)



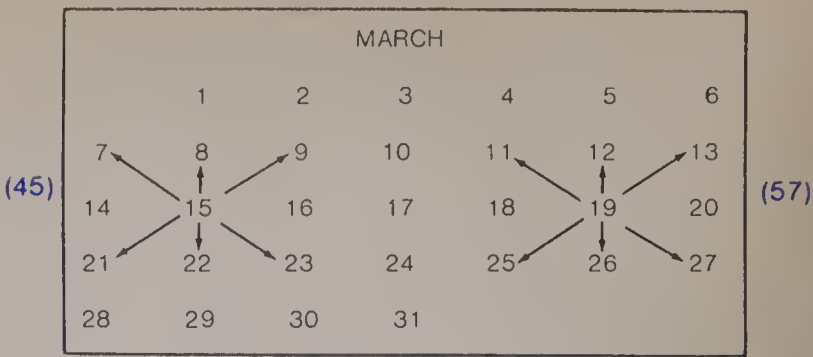
17. Arrange the 12 tiles to form a figure with five tiles on each side.



18. Take a large piece of paper. Fold it once, then again, then again ... for 4 folds. How many sheets thick is the stack? Guess, then check your answer.



19. What is the sum of the numbers along each arrow? Make other patterns with arrows and check the sums.

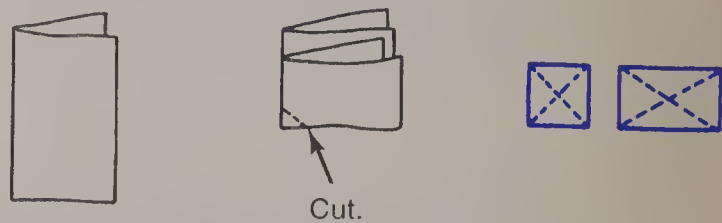


20. I have three sisters and each sister has two brothers. How many boys and girls in the family? (minimum is 5)

21. What two numbers have a product less than their sum? (any number and 0; any number and 1)

22. I am thinking of a number. The ten's digit is 8 more than the one's digit. The product of the two digits is zero. What is my number? (80)

23. Fold a rectangular piece of paper twice. Cut off the corner as shown. Draw what the corner will look like when it is unfolded.



24. How many nickels stacked on top of each other are needed to make a stack as high as a nickel on edge? Guess, then check your guess. (11)

25. I am thinking of a two-digit number. I subtract the one's digit from the ten's digit. The difference is 6. What is my number? How many possible answers are there? (93, 82, 71, 60)

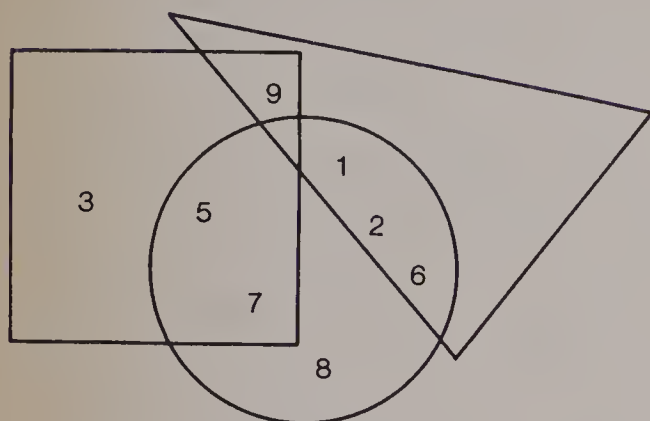
26. I am thinking of a 3-digit number. I add the hundreds and tens, then subtract the ones from the sum. The answer is 9. What is the number? How many possible answers are there? (292, 382, 472, 562, 652, 742, 832, 922, 191, 281, 371, 461, 551, 641, 731, 821, 911, 180, 270, 360, 450, 540, 630, 720, 810)

27. The ten's digit is double the one's digit. The hundred's digit is double the ten's digit. What is the number? Is there more than one? (421, 842)

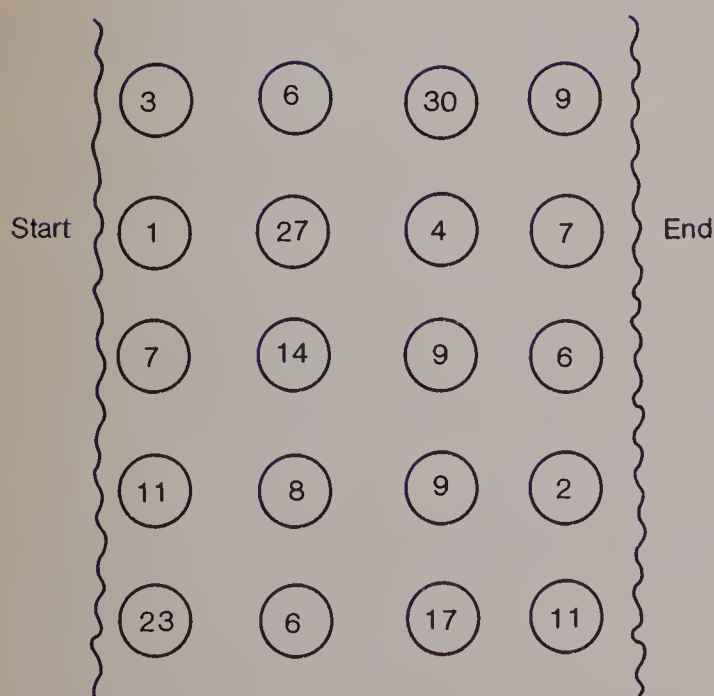
28. How many *different* triangles can you make using a  $3 \times 3$  geo-board (or dot paper)? (8)

29. Write the numerals in the

- (a) circle (1, 2, 6, 5, 7, 8)
- (b) triangle (9, 1, 2, 6)
- (c) circle but not in the triangle (5, 7, 8)
- (d) circle but not in the square (1, 2, 6, 8)
- (e) triangle but not in the square (1, 2, 6)



30. To cross the stream, the sum of the stepping stones used must be 50. How many ways can you find? (You must step from one stone to a stone next to it; you can't skip stones.)



(7, 8, 6, 9, 9, 4, 7;  
11, 8, 14, 9, 6, 2;  
3, 6, 30, 4, 7)

31. How many number combinations can you find? (Use  $+$ ,  $-$ ,  $\div$ ,  $\times$ .) One is marked for you.

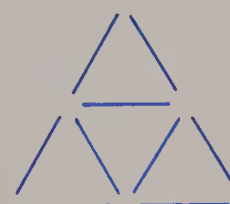
|    |    |    |    |    |
|----|----|----|----|----|
| 3  | 8  | 24 | 4  | 6  |
| 4  | 12 | 8  | 40 | 3  |
| 12 | 20 | 32 | 10 | 2  |
| 2  | 8  | 16 | 14 | 18 |
| 6  | 10 | 20 | 2  | 18 |

32. How many different masses can you get using 1 kg, 2 kg, 4 kg, 8 kg masses? What are they? (All the masses 1 to 15)

33. Using a 5 L and a 3 L container, how would you measure 7 L?

(Fill the 5 L container. Pour 3 L from the 5 L container into the 3 L container. Empty the 3 L container. Pour the 2 L left in the 5 L container into the 3 L container. Fill the 5 L container.  $5 + 2 = 7$ )

34. Use exactly 9 sticks of equal length to form 5 triangles in which the sides of each triangle are the same length.



35. Discover the pattern. Write the next 9 numbers.

2048, 1024, 512, ■, ■, ■, ...  
(256, 128, 64, 32, 16, 8, 4, 2, 1)

36. Use multiplication and addition. What is the largest number you can make using 1, 4, 5. ( $(1 + 4) \times 5 = 25$ )

37. What coins might you have if you have 26¢? (13 different combinations possible)

38. As I was going to St. Ives  
I met a man with seven wives.  
Every wife had seven cats.  
Every cat had seven kittens.  
How many were going to St. Ives?  
Think twice! (1)

# CUMULATIVE TEST ITEM BANK

These items test a number of the major objectives in this book. In using these test items, select from the set up to the page on which your class is working at present. Set A and Set B are matched items to provide opportunity for a pre and post testing or for repeat testing of the objectives. The pages can be easily removed and duplicated if you wish to distribute the test. Be certain that all of the children are familiar with the accepted answer format, whether it involves writing answers directly on a duplicated sheet, or on a separate sheet or workbook page. Demonstrate the sample items on the chalkboard and be sure there are no questions before beginning the test.

## Sample Items

|  |                                     |
|--|-------------------------------------|
| Copy and complete.                         | Add.                                |
| 36 = <u>    </u> tens and <u>    </u> ones | <u>    </u> 4<br>+ 5<br><u>    </u> |

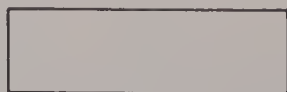
## Answers to Test

1. 8 tens 4 ones    2. 3 tens 7 ones    3. (a) 27 (b) 26
4. (a) 90 (b) 93    5. 16    6. 13    7. 35    8. 59    9. 24, 27, 30
10. 42, 45, 48    11. various    12. various    13.  $4 - 1 = 3$ ,  $4 - 3 = 1$ ,  $3 + 1 = 4$     14.  $9 - 6 = 3$ ,  $3 + 6 = 9$ ,  $6 + 3 = 9$
15. 5    16. 7    17. Tanya had 4 more marbles.    18. Jan saw 9 fewer deer.    19. 23    20. 83    21. 12    22. 13
23. 11    24. 7    25. 5 cm    26. 7 cm    27. 69    28. 95
29. 599    30. 854    31. 83    32. 82    33. 690    34. 770
35. 703    36. 510    37.  $563 > 478$     38.  $259 < 432$
39. They bought 188 stamps.    40. They ate 70 cherries.
41. 615    42. 708    43. 920    44. 720    45. 42    46. 64
47. (a) metre (b) centimetre    48. (a) metre (b) centimetre
49. 19    50. 15    51. 523    52. 321    53. 506    54. 218
55. The larger car is 64 cm longer.    56. Sally's rope is 56 cm longer.    57. 389    58. 465    59. 660    60. 381
61. 678    62. 164

63.

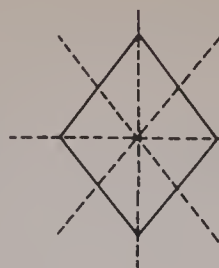


64.

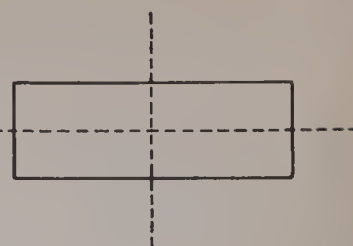


65. cone — (d), cylinder — (c), pyramid — (a), sphere — (b)    66. cube — (d), pyramid — (b), rectangular prism — (a), triangular prism — (c)

67.



68.



69. four-sided shapes, not four-sided shapes    70. things that have round surfaces, things that don't    71. (a) and (c)    72. (b) and (d)    73. (a) 2702 (b) 8106
74. (a) 4008 (b) 7319    75.  $8345 < 8354$     76.  $7035 > 5146$
77. 1137    78. 1410    79. 6 cm    80. 6 cm    81. longer
82. shorter    83. 400    84. 300    85. shorter    86. longer
87. kilogram    88. gram    89. 40 kg    90. 30 kg    91. He needs 568 mm of red trim.    92. The heron is 38 cm taller.

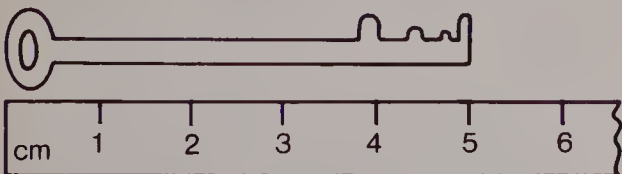
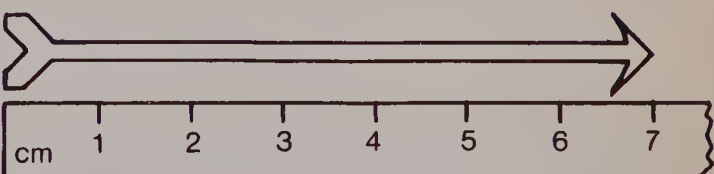
93.  $\frac{1}{4}$     94.  $\frac{2}{5}$     95.  $\frac{1}{3} > \frac{1}{5}$     96.  $\frac{1}{10} < \frac{1}{2}$     97. 0.3    98. 0.7

99. 0.7    100. 0.7    101. 0.5    102. 0.4    103. 10 cans
104. 500 mL    105. \$2.66    106. \$1.48    107. He has 34 horses left.    108. She has 31 geese now.    109. \$11.77
110. \$10.95    111. \$5.22    112. \$23.25    113. Together they cost \$7.30.    114. Together they cost \$15.95.
115. 45¢    116. 35¢    117.  $3 \times 4 = 12$     118.  $4 \times 2 = 8$
119. 40, 45, 50    120. 16, 20, 24    121. 15    122. 16
123. 6    124. 4    125. 0    126. 0    127. 12    128. 20
129. 3    130. 6    131. There are 5 rows.    132. There are 3 rows.    133.  $30 \div 6 = 5$     134.  $24 \div 4 = 6$     135. 10
136. 23    137. 52 cm    138. 68 cm    139. 36 cm
140. 32 cm    141. about 2 dm    142. about 2 dm
143. accept 2-8 kg    144. accept 5-15 kg    145. 15 square units    146. 8 square units    147. 18 cubic units
148. 12 cubic units    149. 31    150. 31    151. 28°C
152. 21°C    153.  $16 - 8 = 8$     154.  $24 - 16 = 8$     155. 08:25
156. 04:40    157. 02:55    158. 08:05    159. 30    160. 36
161.  $12 \div 4 = 3$  or  $12 \div 3 = 4$     162.  $6 \times 3 = 18$  or  $3 \times 6 = 18$     163. 0    164. 0    165. 4    166. 4    167. 6
168. 8    169. (a)    170. (c)    171. (a) and (d)    172. (a) and (c)    173. (a) and (c)    174. (a) and (b)    175. 14    176. 22
177. 48    178. 63    179. 72    180. 40    181. 5    182. 7
183.  $(3 \times 1) \times 4 = 12$ ,  $3 \times (1 \times 4) = 12$     184.  $(4 \times 1) \times 2 = 8$ ,  $4 \times (1 \times 2) = 8$     185. There are 8 rows.    186. There are 8 rows.    187. There are 54 stamps altogether.
188. There are 72 pictures altogether.    189. 60    190. 90
191. 700    192. 800    193. 10    194. 100    195.  $6 \times 7 =$

- $7 \times 6$     196.  $8 \times 7 < 6 \times 7$     197.  $\frac{2}{5}$     198.  $\frac{3}{4}$     199. 7 R 1





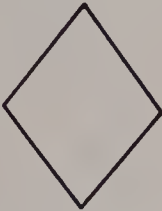
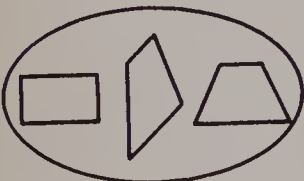
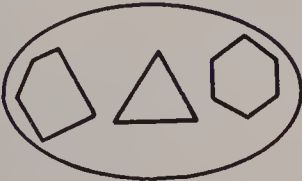




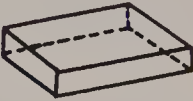

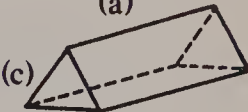

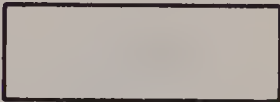
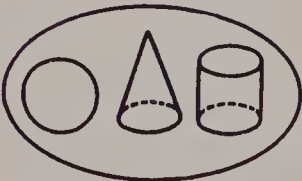
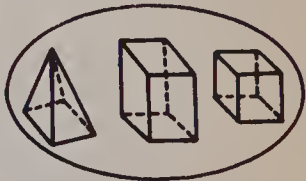




200. 4 R 2    201. She has 9 full boxes and 4 butterflies left over.    202. She has 8 full boxes and 4 pressed flowers left over.


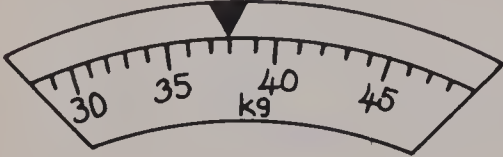
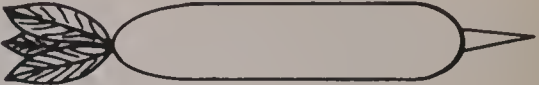

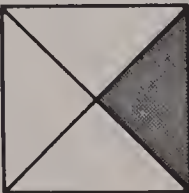







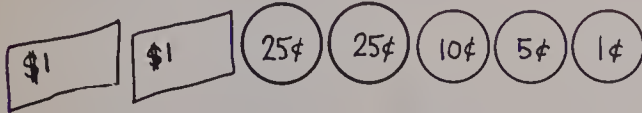
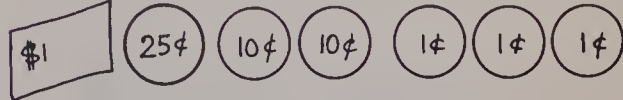
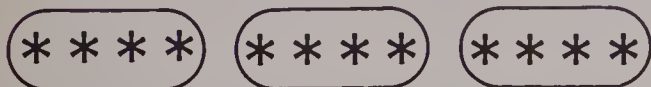
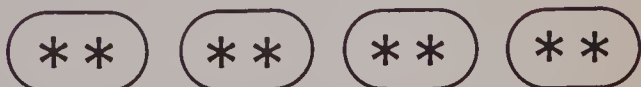
| Page | A  | B  |
|------|--|--|
|      | <p>1. Copy and complete.<br/>84 = ___ tens and ___ ones</p> <p>3. Write the numeral.<br/>(a) 2 tens and 7 ones<br/>(b) twenty-six</p> <p>Add.</p>  | <p>2. Copy and complete.<br/>37 = ___ tens and ___ ones</p> <p>4. Write the numeral.<br/>(a) 9 tens and 0 ones<br/>(b) ninety-three</p> <p>Add.</p>  |
| 10   | <p>5. <math display="block">\begin{array}{r} 8 \\ +8 \\ \hline \end{array}</math></p> <p>7. <math display="block">\begin{array}{r} 30 \\ + 5 \\ \hline \end{array}</math></p>  | <p>6. <math display="block">\begin{array}{r} 7 \\ +6 \\ \hline \end{array}</math></p> <p>8. <math display="block">\begin{array}{r} 54 \\ + 5 \\ \hline \end{array}</math></p>  |
| 20   | <p>9. Copy and complete.<br/>15, 18, 21, ___, ___, ___</p> <p>11. Write an odd number.</p> <p>13. Write 3 related number stories.<br/><math>1 + 3 = 4</math></p> <p>15. Subtract. <math display="block">\begin{array}{r} 9 \\ -4 \\ \hline \end{array}</math></p> <p>17. Tim has 9 marbles.<br/>Tanya has 13 marbles.<br/>How many more marbles did Tanya have?</p> <p>19. Subtract. <math display="block">\begin{array}{r} 28 \\ - 5 \\ \hline \end{array}</math></p> | <p>10. Copy and complete.<br/>33, 36, 39, ___, ___, ___</p> <p>12. Write an even number.</p> <p>14. Write 3 related number stories.<br/><math>9 - 3 = 6</math></p> <p>16. Subtract. <math display="block">\begin{array}{r} 16 \\ - 9 \\ \hline \end{array}</math></p> <p>18. Mark saw 18 deer.<br/>Jan saw 9 deer.<br/>How many fewer deer did Jan see?</p> <p>20. Subtract. <math display="block">\begin{array}{r} 87 \\ - 4 \\ \hline \end{array}</math></p> |
| 30   | <p>21. Add. <math display="block">\begin{array}{r} 4 \\ 3 \\ +5 \\ \hline \end{array}</math></p> <p>23. Write our numeral for:<br/>XI</p> <p>25. What is the length in centimetres?<br/></p> <p>Add.</p>  | <p>22. Add. <math display="block">\begin{array}{r} 3 \\ 5 \\ +5 \\ \hline \end{array}</math></p> <p>24. Write our numeral for:<br/>VII</p> <p>26. What is the length in centimetres?<br/></p> <p>Add.</p>  |
| 40   | <p>27. <math display="block">\begin{array}{r} 26 \\ +43 \\ \hline \end{array}</math></p>   | <p>28. <math display="block">\begin{array}{r} 35 \\ +60 \\ \hline \end{array}</math></p>   |



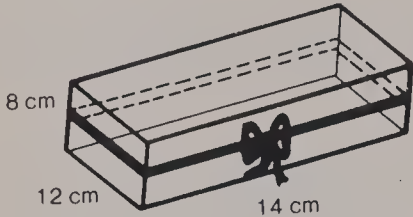
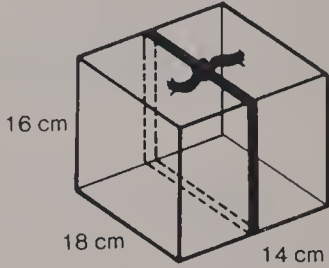
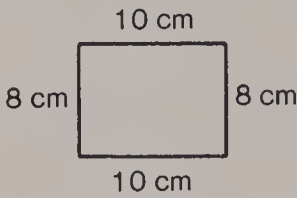
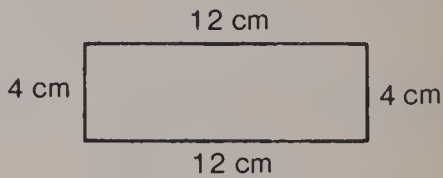

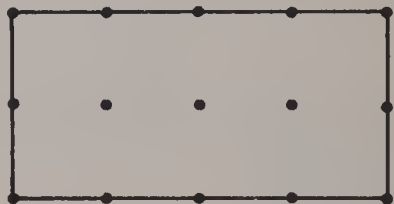
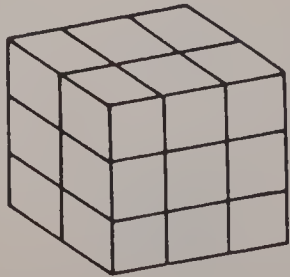
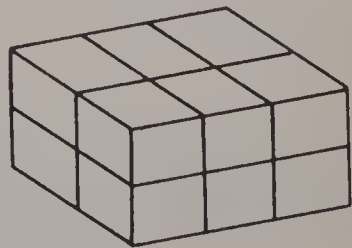
| Page | A  | B  |
|------|--|--|
|      | <p>29. <math>\begin{array}{r} 384 \\ +215 \\ \hline \end{array}</math></p> <p>31. <math>\begin{array}{r} 64 \\ +19 \\ \hline \end{array}</math></p> <p>33. <math>\begin{array}{r} 376 \\ +314 \\ \hline \end{array}</math></p> <p>35. Write the numeral.<br/>7 hundreds 0 tens 3 ones</p> <p>37. Copy and complete. Use <math>&gt;</math> or <math>&lt;</math>.<br/>563 <math>\bullet</math> 478</p> | <p>30. <math>\begin{array}{r} 821 \\ + 33 \\ \hline \end{array}</math></p> <p>32. <math>\begin{array}{r} 44 \\ +38 \\ \hline \end{array}</math></p> <p>34. <math>\begin{array}{r} 643 \\ +127 \\ \hline \end{array}</math></p> <p>36. Write the numeral.<br/>5 hundreds 1 ten 0 ones</p> <p>38. Copy and complete. Use <math>&gt;</math> or <math>&lt;</math>.<br/>259 <math>\bullet</math> 432</p>  |
| 50   | <p>39. Melvin bought 32 stamps.<br/>Michel bought 156 stamps.<br/>How many did they both buy?</p> <p>Add.</p> <p>41. <math>\begin{array}{r} 361 \\ +254 \\ \hline \end{array}</math></p> <p>43. <math>\begin{array}{r} 732 \\ +188 \\ \hline \end{array}</math></p> <p>45. Subtract. <math>\begin{array}{r} 47 \\ - 5 \\ \hline \end{array}</math></p>   | <p>40. Reg ate 23 cherries.<br/>Kim ate 47 cherries.<br/>How many did they both eat?</p> <p>Add.</p> <p>42. <math>\begin{array}{r} 272 \\ +436 \\ \hline \end{array}</math></p> <p>44. <math>\begin{array}{r} 459 \\ +261 \\ \hline \end{array}</math></p> <p>46. Subtract. <math>\begin{array}{r} 68 \\ - 4 \\ \hline \end{array}</math></p>  |
| 60   | <p>47. Which is the better unit,<br/>the centimetre or metre, for<br/>measuring each?</p> <p>(a) length of a car<br/>(b) length of a pencil</p> <p>Subtract.</p> <p>49. <math>\begin{array}{r} 36 \\ -17 \\ \hline \end{array}</math></p> <p>51. <math>\begin{array}{r} 643 \\ -120 \\ \hline \end{array}</math></p> <p>53. <math>\begin{array}{r} 554 \\ - 48 \\ \hline \end{array}</math></p>      | <p>48. Which is the better unit,<br/>the centimetre or metre, for<br/>measuring each?</p> <p>(a) length of a garden hose<br/>(b) length of a cat</p> <p>Subtract.</p> <p>50. <math>\begin{array}{r} 43 \\ -28 \\ \hline \end{array}</math></p> <p>52. <math>\begin{array}{r} 752 \\ -431 \\ \hline \end{array}</math></p> <p>54. <math>\begin{array}{r} 632 \\ -414 \\ \hline \end{array}</math></p> |
| 70   | <p>55. The length of the larger car is 342 cm.<br/>The length of the smaller car is 278 cm.<br/>How much longer is the larger car?</p>   | <p>56. Sally's skipping rope is 214 cm long.<br/>Vicki's skipping rope is 158 cm long.<br/>How much longer is Sally's skipping rope?</p>   |

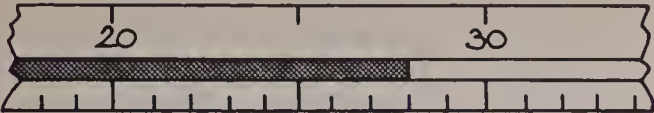
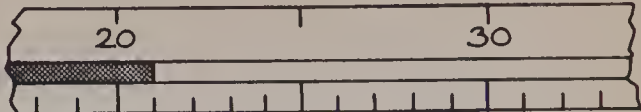




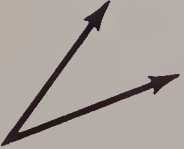





| Page | A  | B  |
|------|--|--|
|      | <p>Subtract.</p> <p>57. <math>\begin{array}{r} 652 \\ -263 \\ \hline \end{array}</math></p> <p>59. <math>\begin{array}{r} 803 \\ -143 \\ \hline \end{array}</math></p> <p>80 61. <math>\begin{array}{r} 905 \\ -227 \\ \hline \end{array}</math></p> <p>63. Draw a triangle.</p> <p>90 65. Match:</p> <div> <div>cone</div> <div>(a) </div> <div>(b) </div> <div>cylinder</div> <div>(c) </div> <div>(d) </div> <div>pyramid</div> <div>sphere</div> </div> <p>67. Draw in the lines of symmetry.</p> <div></div> <p>69. Name a rule used in this sorting.</p> <div> <div></div> <div></div> </div> <p>100 71. Which shapes are similar?</p> <div> <div>(a) </div> <div>(b) </div> <div>(c) </div> <div>(d) </div> </div> <p>73. Write the numeral.</p> <p>(a) 2 thousands 7 hundreds 0 tens 2 ones</p> <p>(b) eight thousand, one hundred six</p> <p>75. Use <math>&gt;</math> or <math>&lt;</math>.</p> <p><math>8345 \bullet 8354</math></p> | <p>Subtract.</p> <p>58. <math>\begin{array}{r} 843 \\ -378 \\ \hline \end{array}</math></p> <p>60. <math>\begin{array}{r} 604 \\ -223 \\ \hline \end{array}</math></p> <p>62. <math>\begin{array}{r} 602 \\ -438 \\ \hline \end{array}</math></p> <p>64. Draw a rectangle.</p> <p>66. Match:</p> <div> <div>cube</div> <div>(a) </div> <div>(b) </div> <div>pyramid</div> <div>(c) </div> <div>(d) </div> <div>rectangular prism</div> <div>triangular prism</div> </div> <p>68. Draw in the lines of symmetry.</p> <div></div> <p>70. Name a rule used in this sorting.</p> <div> <div></div> <div></div> </div> <p>72. Which shapes are similar?</p> <div> <div>(a) </div> <div>(b) </div> <div>(c) </div> <div>(d) </div> </div> <p>74. Write the numeral.</p> <p>(a) 4 thousands 0 hundreds 0 tens 8 ones</p> <p>(b) seven thousand, three hundred nineteen</p> <p>76. Use <math>&gt;</math> or <math>&lt;</math>.</p> <p><math>7035 \bullet 5146</math></p> |

| Page | A   | B  |
|------|---|--|
|      | <p>77. Add. <math display="block">\begin{array}{r} 679 \\ +458 \\ \hline \end{array}</math></p>   | <p>78. Add. <math display="block">\begin{array}{r} 721 \\ +689 \\ \hline \end{array}</math></p>  |
| 110  | <p>79. Use your ruler. What is the length to the nearest centimetre?</p>  <p>81. Is a decimetre longer or shorter than a centimetre?</p> <p>83. <math>4\text{ m} = \underline{\hspace{1cm}}\text{ cm}</math></p> <p>85. Is a metre longer or shorter than a kilometre?</p> <p>87. Which is the better unit, the gram or kilogram, to use in measuring a pumpkin?</p> <p>89. Write the mass rounded to the nearest 10 kg.</p>  | <p>80. Use your ruler. What is the length to the nearest centimetre?</p>  <p>82. Is a decimetre longer or shorter than a metre?</p> <p>84. <math>3\text{ m} = \underline{\hspace{1cm}}\text{ cm}</math></p> <p>86. Is a kilometre longer or shorter than a metre?</p> <p>88. Which is the better unit, the gram or kilogram, to use in measuring an orange?</p> <p>90. Write the mass rounded to the nearest 10 kg.</p>  |
| 120  | <p>91. A carpenter needs 836 mm of red trim. He has 268 mm of red trim. How many more millimetres of red trim does he need?</p> <p>93. Write a fraction for the shaded part.</p>   | <p>92. A heron is about 136 cm tall. A crane is about 98 cm tall. How many centimetres taller is the heron than the crane?</p> <p>94. Write a fraction for the shaded part.</p>   |
| 130  | <p>95. Use <math>&gt;</math> or <math>&lt;</math>. <math>\frac{1}{3} \bullet \frac{1}{5}</math></p>  <p>97. Write a decimal for the shaded part.</p>    | <p>96. Use <math>&gt;</math> or <math>&lt;</math>. <math>\frac{1}{10} \bullet \frac{1}{2}</math></p>  <p>98. Write a decimal for the shaded part.</p>    |

| Page | A   | B  |
|------|---|--|
|      | <p>99. Add. <math display="block">\begin{array}{r} 0.3 \\ +0.4 \\ \hline \end{array}</math></p> <p>101. Subtract. <math display="block">\begin{array}{r} 0.8 \\ -0.3 \\ \hline \end{array}</math></p> <p>103. How many 100 mL cans of tomato juice are needed to make 1 L?</p>  | <p>100. Add. <math display="block">\begin{array}{r} 0.6 \\ +0.1 \\ \hline \end{array}</math></p> <p>102. Subtract. <math display="block">\begin{array}{r} 0.6 \\ -0.2 \\ \hline \end{array}</math></p> <p>104. How many millilitres are 0.5 L?</p>   |
| 140  | <p>105. How much money?</p>  <p>107. Mr. West has 60 horses on his ranch.<br/>He has 48 cows also.<br/>He sells 26 horses.<br/>How many horses does he have left?</p> <p>109. Add. <math display="block">\begin{array}{r} \\$7.22 \\ + 4.55 \\ \hline \end{array}</math></p> <p>111. Subtract. <math display="block">\begin{array}{r} \\$13.86 \\ - 8.64 \\ \hline \end{array}</math></p> <p>113. A kite costs \$2.98.<br/>A frisbee costs \$4.32.<br/>How much do a kite and frisbee together cost?</p> | <p>106. How much money?</p>  <p>108. Mrs. Wong has 56 chickens and 14 geese.<br/>She gets 17 more geese.<br/>How many geese does she have now?</p> <p>110. Add. <math display="block">\begin{array}{r} \\$8.32 \\ + 2.63 \\ \hline \end{array}</math></p> <p>112. Subtract. <math display="block">\begin{array}{r} \\$43.35 \\ - 20.10 \\ \hline \end{array}</math></p> <p>114. A ball costs \$6.33.<br/>A bat costs \$9.62.<br/>How much do a bat and ball together cost?</p> |
| 150  | <p>115. Cost of soft drink is 55¢.<br/>Gave clerk one-dollar bill.<br/>What change should clerk give?</p>   | <p>116. Cost of ferris wheel ride is 65¢.<br/>Gave one-dollar bill.<br/>What change should be received?</p>  |
| 160  | <p>117. Write a multiplication story for:</p>  <p>119. Write the next three numbers.<br/>25, 30, 35, __, __, __</p> <p>121. <math>5 \times 3 = \underline{\quad}</math></p>  | <p>118. Write a multiplication story for:</p>  <p>120. Write the next three numbers.<br/>4, 8, 12, __, __, __</p> <p>122. <math>4 \times 4 = \underline{\quad}</math></p>  |
| 170  | <p>123. <math>6 \times 1 = \underline{\quad}</math></p> <p>125. <math>15 \times 0 = \underline{\quad}</math></p> <p>127. <math display="block">\begin{array}{r} 3 \\ \times 4 \\ \hline \end{array}</math></p> <p>129. <math>9 \div 3 = \underline{\quad}</math></p>  | <p>124. <math>4 \times 1 = \underline{\quad}</math></p> <p>126. <math>42 \times 0 = \underline{\quad}</math></p> <p>128. <math display="block">\begin{array}{r} 5 \\ \times 4 \\ \hline \end{array}</math></p> <p>130. <math>24 \div 4 = \underline{\quad}</math></p>  |

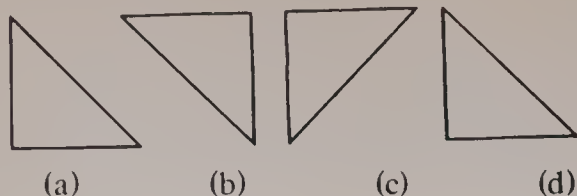


| Page | A  | B  |
|------|--|--|
|      | <p><b>131.</b> There are 20 children in rows.<br/>There are 4 children in each row.<br/>How many rows are there?</p>   | <p><b>132.</b> There are 15 members in the band.<br/>There are 5 members in each row.<br/>How many rows are there?</p>   |
| 180  | <p><b>133.</b> Write a related division sentence.<br/><math>30 \div 5 = 6</math></p>   | <p><b>134.</b> Write a related division sentence.<br/><math>24 \div 6 = 4</math></p>   |
| 190  | <p><b>135.</b> <math>10 \div 1 = \underline{\quad}</math></p> <p><b>137.</b> How many centimetres of ribbon are needed to go around the box?</p>    | <p><b>136.</b> <math>23 \div 1 = \underline{\quad}</math></p> <p><b>138.</b> How many centimetres of rope are necessary to go around the box?</p>   |
|      | <p><b>139.</b> What is the perimeter of the rectangle?</p>   | <p><b>140.</b> What is the perimeter of the rectangle?</p>   |
|      | <p><b>141.</b> About how many decimetres long is a new pencil?</p> <p><b>143.</b> About how many kilograms is a little puppy?</p> <p><b>145.</b> What is the area in square units?</p>  | <p><b>142.</b> About how many decimetres wide is this page?</p> <p><b>144.</b> About how many kilograms is a Thanksgiving turkey?</p> <p><b>146.</b> What is the area in square units?</p>  |
| 200  | <p><b>147.</b> What is the number of cubic units?</p>   | <p><b>148.</b> How many cubic units in this rectangular prism?</p>    |

| Page | A  | B  |
|------|--|--|
|      | <p>149. How many days in the month of July?</p> <p>151. What is the temperature in degrees Celsius?</p>  <p>153. Write a number sentence to solve this problem.</p> <p>16 geese in the pond.<br/>8 ducks in the pond.<br/>How many more geese?</p>  | <p>150. How many days in the month of January?</p> <p>152. What is the temperature in degrees Celsius?</p>  <p>154. Write a number sentence to solve this problem.</p> <p>Susan plants 24 flowers.<br/>16 blue, the rest red.<br/>How many red?</p>  |
| 210  | <p>155. What time does the clock show?</p>    | <p>156. What time does the clock show?</p>    |
| 220  | <p>157. What time will it be 20 min from now?</p>    | <p>158. What time was it 15 min before this?</p>   |
| 230  | <p>159. <math>5 \times 6 = \underline{\quad}</math></p> <p>161. Write a related division sentence.</p> <p><math>3 \times 4 = 12</math></p> <p>163. <math>0 \div 3 = \underline{\quad}</math></p> <p>165. <math>5 \overline{)20}</math></p>   | <p>160. <math>4 \times 9 = \underline{\quad}</math></p> <p>162. Write a related multiplication sentence.</p> <p><math>18 \div 3 = 6</math></p> <p>164. <math>0 \div 9 = \underline{\quad}</math></p> <p>166. <math>4 \overline{)16}</math></p>   |
| 240  | <p>167. <math>10 \overline{)60}</math></p> <p>169. Which of these show an angle?</p> <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;">  <p>(a)</p> </div> <div style="text-align: center;">  <p>(b)</p> </div> <div style="text-align: center;">  <p>(c)</p> </div> </div> | <p>168. <math>10 \overline{)80}</math></p> <p>170. Which is a segment?</p> <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;">  <p>(a)</p> </div> <div style="text-align: center;">  <p>(b)</p> </div> <div style="text-align: center;">  <p>(c)</p> </div> </div> |

250

171. Which shapes show a slide?

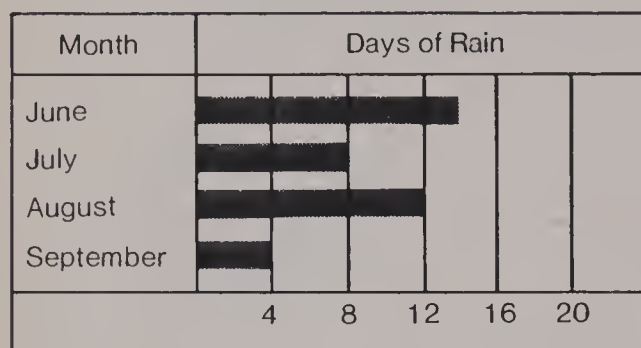


173. Which shapes are the same shape?



260

175. How many days of rain in June?



$$\begin{array}{r} 177. \quad 8 \\ \times 6 \\ \hline \end{array}$$

270

$$\begin{array}{r} 179. \quad 8 \\ \times 9 \\ \hline \end{array}$$

$$181. \quad 7 \overline{) 35}$$

183. Multiply 2 different ways. Use brackets.

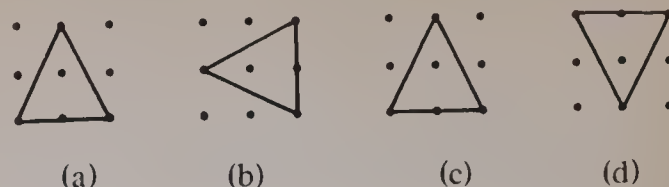
$$3 \times 1 \times 4$$

185. A gardener has 56 strawberry plants.  
There are 7 plants in each row.  
How many rows are there?

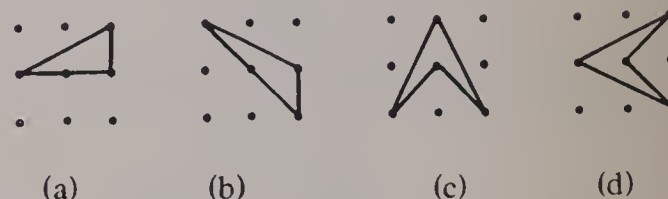
280

187. There are 6 pages of stamps in the book.  
There are 9 stamps on each page.  
How many stamps altogether?

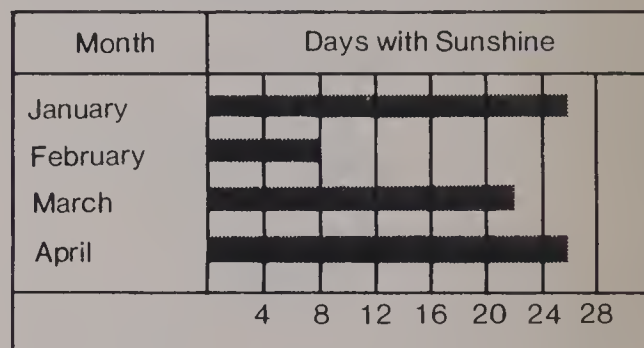
172. Which shapes show a slide?



174. Which shapes are the same shape?



176. How many days with sunshine in March?



$$\begin{array}{r} 178. \quad 9 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 180. \quad 5 \\ \times 8 \\ \hline \end{array}$$



$$182. \quad 8 \overline{) 56}$$

184. Multiply 2 different ways. Use brackets.

$$4 \times 1 \times 2$$

186. There are 64 flowers in the garden.  
There are 8 flowers in each row.  
How many rows are there?

188. There are 8 pictures on each page.  
There are 9 pages of pictures.  
How many pictures altogether?

| Page | A  | B  |
|------|--|--|
|      | <p>189. <math>6 \times 10 = \underline{\hspace{1cm}}</math></p> <p>191. <math>100 \times 7 = \underline{\hspace{1cm}}</math></p> <p>193. <math>10 \overline{)100}</math></p> <p>195. Use <math>&gt;</math>, <math>&lt;</math>, or <math>=</math>.<br/> <math>6 \times 7 \bullet 7 \times 6</math></p> <p>197. What fraction is shaded?</p>  <p>199. <math>3 \overline{)22} \begin{array}{l} \text{---R---} \\ \text{---} \end{array}</math></p> <p>201. Cathy has 76 butterflies.<br/> She puts 8 in each box.<br/> How many full boxes does she have?<br/> How many does she have left over?</p> | <p>190. <math>9 \times 10 = \underline{\hspace{1cm}}</math></p> <p>192. <math>100 \times 8 = \underline{\hspace{1cm}}</math></p> <p>194. <math>10 \overline{)1000}</math></p> <p>196. Use <math>&gt;</math>, <math>&lt;</math>, or <math>=</math>.<br/> <math>8 \times 7 \bullet 6 \times 7</math></p> <p>198. What fraction is shaded?</p>  <p>200. <math>4 \overline{)18} \begin{array}{l} \text{---R---} \\ \text{---} \end{array}</math></p> <p>202. Stella has 68 pressed flowers.<br/> She has 8 in each box.<br/> How many full boxes does she have?<br/> How many does she have left over?</p> |



# CHAPTER 1 OVERVIEW

This chapter reviews basic concepts involving one- and two-digit numbers, place value, and basic number facts.

## OBJECTIVES

- A To review and compare the meaning of one- and two-digit numbers
- B To add and subtract to sum 18 in horizontal and vertical formats
- C To count by 2's and 3's
- D To identify odd and even numbers
- E To identify Roman numerals to 12
- F To solve word problems

## BACKGROUND

Children using this text will need to have a variety of materials readily available in order to accommodate different levels of development. The sequence of stages in mathematics which they will pass through will require the use of concrete materials, then pictorial representations, and lastly, abstract symbols. Care should be taken to ensure that pupils are not working beyond their developmental level in order to minimize future difficulties in mathematics. The children should be encouraged to work through questions concretely, discuss their findings, and record their results. Particular emphasis should be given to preliminary work on place value in which the children will have opportunities to "build" numbers using concrete materials. This will provide a firm foundation on which to build further concepts involving our system of number notation. The familiar nature of much of the material presented in this chapter makes it an ideal place to concentrate efforts not only on the mathematical concepts being reviewed, but on the details of work habits and child response format as well. Keep in mind that this may very well be among the child's first experiences with a mathematics

textbook and that this in itself requires additional skills which can present new difficulties. Be sure the child understands and is familiar with the accepted classroom procedure involved in completing assignments. Considerable time and effort for both child and teacher alike may be saved if in early exposure, the children view demonstrations (chalkboard, overhead projector, experience chart paper) of an assigned task being completed. Allow them to watch and listen, or pretend to "eavesdrop," as information and instructions are read, interpreted, transcribed, reasoned through, and finally responded to on a sample of the appropriate workbook or work sheet. Keep these "models" displayed in the classroom for quick and easy future reference, perhaps along with various samples of the children's own work. Time spent establishing and reinforcing the ground rules of what will be a consistent method of reporting, answering and completing assigned tasks, and correcting mistakes will more quickly enable the child to get to the more enjoyable business of exploring new mathematical concepts.

## MATERIALS

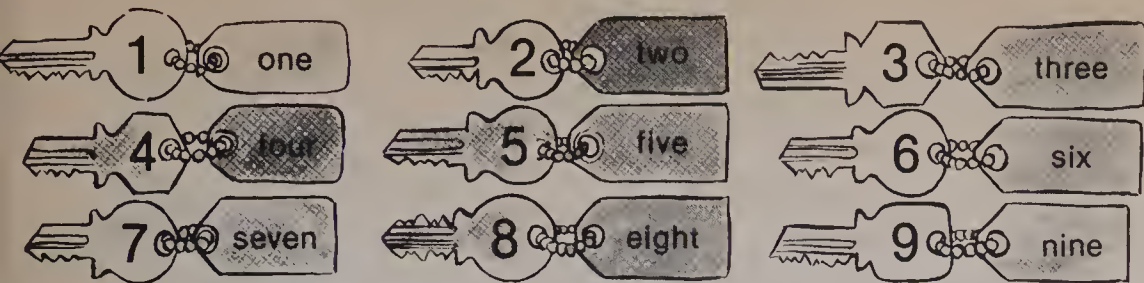
|                               |                    |
|-------------------------------|--------------------|
| variety of concrete materials | stir sticks        |
| centimetre cubes              | poker chips        |
| Unifix cubes                  | place-value charts |
| dominoes                      | clothes pins       |
| hockey cards                  | marbles            |

## CAREER AWARENESS

### Conservation Officer [29]

This topic could be a starting point for further studies in an integrated approach—a basic understanding of the importance of animals to one another, to us, and the need to preserve and protect animal life.






# Numbers



Write the numerals.

- |          |   |         |   |          |   |
|----------|---|---------|---|----------|---|
| 1. five  | 5 | ● nine  | 9 | ● two    | 2 |
| 4. three | 3 | 5. one  | 1 | 6. six   | 6 |
| 7. seven | 7 | 8. four | 4 | 9. eight | 8 |

How many?

- |  |   |   |   |   |  |
|--|---|---|---|---|--|
| 10.  | ● | 11.  | 12.  | 13.  | 14.  |
| 7  |   | 5   | 8   | 6   | 9  |

What is missing?

- |                     |           |             |           |             |           |             |      |
|---------------------|-----------|-------------|-----------|-------------|-----------|-------------|------|
| 15. 4, <u>5</u> , 6 | ● 3, ■, 5 | 4           | ● 1, ■, 3 | 2           | ● 6, ■, 8 | 7           |      |
| 19. 7, ■, 9         | 8         | 20. 2, ■, 4 | 3         | 21. 6, ■, ■ | 7, 8      | 22. 1, ■, ■ | 2, 3 |
| 23. 2, ■, ■         | 3, 4      | 24. 5, ■, ■ | 6, 7      | 25. 7, ■, ■ | 8, 9      | 26. 3, ■, ■ | 4, 5 |
| 27. ■, ■, 4         | 2, 3      | 28. ■, ■, 6 | 4, 5      | 29. ■, ■, 9 | 7, 8      | 30. ■, ■, 3 | 1, 2 |

1-digit numbers 1

**Using the Book** Direct the children to the display. "Read the number on the key and on the key tag." "Put your finger on the keys as I am doing." (You place your finger over the keys on the left.) "Now read the words on the key tags." Repeat for the other keys.

Give specific directions as to how the children are to do Exercises 1-14 in their workbooks. You may wish to indicate that the red dot over some exercises (2, 3, 16, 17, 18) indicate that the answers to these questions are in the back of the book.

In preparation for Exercises 15-30, discuss the order of one-digit numbers. Have the children tell what number is missing in a sequence and what comes before or after a given number.

## Variation:

All children except one close their eyes. The one turns over 3 footprints. The others open their eyes and are to name the numbers on each footprint turned over.

## OBJECTIVE

To recognize the value and relative order of one-digit numbers

## PACING

Level A All  
Level B All  
Level C All

## MATERIALS

variety of concrete materials, such as bottle caps, popsicle sticks, buttons, cubes, bundles of sticks, yarn, etc.

## RELATED AIDS

BFA COMP LAB I—1-3.

## BACKGROUND

This may be the first math textbook for the children. How the children are to record the answers in their exercise books should be clearly illustrated. (See Chapter Overview.) Emphasize that the child is NOT to write in the textbook.

## SUGGESTIONS

**Initial Activity** Have the children count items in a collection of materials and make a list giving the numerical value of each set of things.

Have the children find sets of things in the classroom whose numerical value is less than ten. Record their findings individually or in group chart form.

## ACTIVITIES

1. Provide children with a key pattern (or several types of real keys for tracing if available), string, and construction paper for key tags. Ask them to duplicate a set of keys with key chains as suggested in the display.

2. Make a graph (pictograph) using gummed circles to represent sets of objects in the classroom whose numerical value is less than 10. Order these on a chart.

3. Group the children in nines or less. Each child is to trace and cut out a footprint. (Provide a pattern.) Each child is assigned a number to write on the footprint. The footprints are placed on the floor in order and the children are to step on them.





## OBJECTIVE

To recognize place-value meaning for two-digit numbers

## PACING

- Level A 2 All  
3 1-8, 11-22
- Level B 2 All  
3 1-18, 23-26
- Level C 2 6-9  
3 2, 7-9, 12, 17-26

## VOCABULARY

numeral

## MATERIALS

number cards 0-9, variety of materials suited to grouping into sets of ten — cubes, bundles of sticks, yarn and buttons, and so on

## RELATED AIDS

- Page 2  
HMS—DM2 and DM3.
- Page 3  
HMS—DM2.  
BFA COMP LAB I—17, 20.

## BACKGROUND

While the drawings on these pages show the 10's as a vertical column, 10's may be shown in other ways also. In the classroom, the 10's may be a horizontal row or a bundle of 10 items with an elastic band, as in the case of a bundle of 10 pencils or 10 stir sticks. Experiences with a variety of objects help the children generalize the concept of number and place value.

## SUGGESTIONS

**Initial Activity** Have the children count out a set of ten objects and group these in some way — an elastic around 10 sticks, putting centimetre cubes together.

Now have the children count out one more object each time. Have the children count these as “one ten and one, one ten and two, etc.” to establish the idea of a set of ten and a remainder. When the children complete another set of ten, they may again group this set and continue as previously — “two tens and one, two tens and two, etc.” Continue to “nine tens and nine”.

Discuss the value of a variety of groups of ten and loose objects.

Establish the meaning of the relative position of the numbers in a two-digit number — 43:

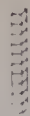
“The 4 means 4 tens.

The 3 means 3 ones.”

## Tens and Ones

Count some cubes.

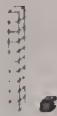
When you have 10, put them in a long row like this.



1 ten → 10



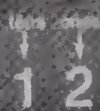
Count some more cubes.



1 ten and 1 one → 11



1 ten and 2 ones → 12



The 1 in 12 means 1 ten.  
The 2 in 12 means 2 ones.

Find how many.

1.



24

2.



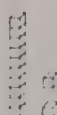
36

3.



53

4.



18

5.



42

6.



65

7.



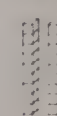
31

8.



57

9.



29

2 2-digit numbers

**Using the Book** 1. While discussing the display, have the children name the number of cubes in two ways in answer to “How many cubes?” In assigning the exercises on each page clearly set out the manner in which the children are to record their answers. “Write the number 1 in your book. Beside the number 1, tell how many cubes you see by writing the number of tens and ones.” Repeat for Exercises 2 through 9.

2. Direct the children to read and follow the directions on the top of page 3, telling them the first question is done as an example. For Exercises 11-22, explicit instructions similar to those for page 2 should be given.



How many tens and ones? Copy and complete.

1.  $14 = 1$  ten and  $4$  ones
3.  $43 = 4$  tens and  $3$  ones
5.  $18 = 1$  ten and  $8$  ones
7.  $84 = 8$  tens and  $4$  ones
9.  $40 = 4$  tens and  $0$  ones
2.  $26 = 2$  tens and  $6$  ones
4.  $35 = 3$  tens and  $5$  ones
6.  $51 = 5$  tens and  $1$  one
8.  $22 = 2$  tens and  $2$  ones
10.  $97 = 9$  tens and  $7$  ones

Write the numerals.

11. 3 tens and 7 ones  $37$
13. 8 tens and 6 ones  $86$
15. 6 tens and 0 ones  $60$
17. 5 tens and 4 ones  $54$
19. 9 tens and 3 ones  $93$
21. 3 tens and 6 ones  $36$
12. 1 ten and 9 ones  $19$
14. 2 tens and 5 ones  $25$
16. 4 tens and 2 ones  $42$
18. 7 tens and 1 one  $71$
20. 1 ten and 5 ones  $15$
22. 8 tens and 0 ones  $80$

Tell what the 2 means.

23. 27  $2$  tens
24. 42  $2$  ones
25. 32  $2$  ones
26. 22  $2$  tens and  $2$  ones

2-digit numbers 3

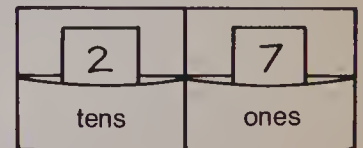
## ACTIVITIES

1. Provide between 15 and 40 counters to each child. Direct the child to group the counters in sets of tens and extra ones. Record in a chart the number of tens and extra ones. Discuss how we do not need to label the columns since we agree on the meaning of each.

2. Have the children cut out the numbers from a calendar, prices from advertising, and so on. The children choose a number and must write down what that number represents — “82: 8 tens and 2 ones.”

Relate all activities, as much as possible, to practical experiences — reading the date in “place value”: 21st → 2 tens and 1 one.

3. Two place-value charts are set on the chalkboard ledge. Each team is given a set of number cards labelled 0 through 9. A two-digit number is called and the first team to race to the chalkboard and place the proper number cards in the correct pockets in its chart wins a point.



## EXTRA PRACTICE

How many tens and ones?

1.  $79 =$   $\blacksquare$  tens and  $\blacksquare$  ones
2.  $46 =$   $\blacksquare$  tens and  $\blacksquare$  ones
3.  $68 =$   $\blacksquare$  tens and  $\blacksquare$  ones
4.  $49 =$   $\blacksquare$  tens and  $\blacksquare$  ones
5.  $32 =$   $\blacksquare$  tens and  $\blacksquare$  ones

Write the numerals.

6. 7 tens and 8 ones
7. 9 tens and 5 ones
8. 2 tens and 6 ones
9. 4 tens and 9 ones
10. 5 tens and 7 ones

Tell what the 4 means.

11. 34
12. 24
13. 46
14. 48

## OBJECTIVE

To write numbers in a place-value chart

## PACING

Level A All  
Level B All  
Level C All

## MATERIALS

centimetre cubes, bottle caps, stir sticks, etc., place-value charts, number cards 0 to 9

## RELATED AIDS

HMS—DM4.  
BFA COMP LAB I—17.

## SUGGESTIONS

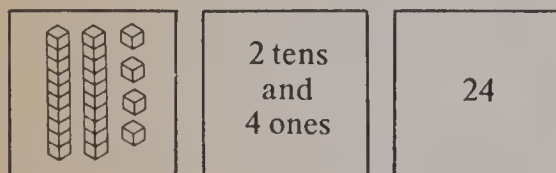
**Initial Activity** Use concrete materials to make groups of tens and ones. Ensure that the children understand the relative position and number values of several examples of two-digit numbers.

Introduce the place-value chart and record, as a group, from several examples given by the children.

## ACTIVITIES

1. Have the children use stir sticks to represent two-digit numbers and then have them record on a place-value chart.

2. Make three decks of matching cards.



The numeral is written on the back of each set, in small print.

### *Solitaire:*

The child is to match the cards from the 3 decks. They self-check by turning cards over.

### *2 or more players:*

Each player is dealt 2 cards from each deck.

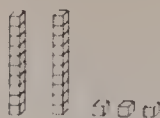
Game is played like Rummy. A player must get two sets of matching cards to "win".

3. Provide two dice each numbered with a selection from 0-9. Red die is the tens; blue die is the ones. Player rolls dice and writes the number rolled in 3 ways.

4. See the "Place-Value Game" in the Activity Reservoir.

## A Tens and Ones Chart

Build 2 tens and 3 ones using cubes.  
How many cubes did you use?



2 tens and 3 ones

We can put this in a **tens and ones** chart.

How many tens? \_\_\_\_\_

How many ones? \_\_\_\_\_

| tens | ones |
|------|------|
| 2    | 3    |

You can make this number 3 ways.



23 = 2 tens and 3 ones.

23 =

| tens | ones |
|------|------|
| 2    | 3    |

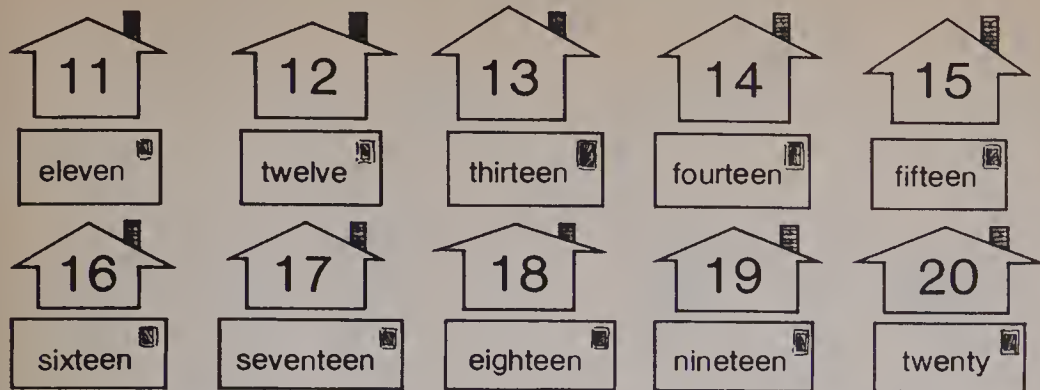
Make a **tens and ones chart** and write the numerals like this:

- |                       | tens | ones |                       | tens | ones |
|-----------------------|------|------|-----------------------|------|------|
| 1. 3 tens and 5 ones  | 3    | 5    | 2. 2 tens and 6 ones  |      |      |
| 3. 5 tens and 2 ones  | 5    | 2    | 4. 1 ten and 4 ones   |      |      |
| 5. 4 tens and 5 ones  | 4    | 5    | 6. 6 tens and 2 ones  |      |      |
| 7. 8 tens and 6 ones  | 8    | 6    | 8. 5 tens and 1 one   |      |      |
| 9. 2 tens and 3 ones  | 2    | 3    | 10. 3 tens and 7 ones |      |      |
| 11. 7 tens and 4 ones | 7    | 4    | 12. 1 ten and 8 ones  |      |      |

4 Place-value charts

**Using the Book** Emphasize the meaning of the place-value chart shown in the display and how to record in the chart. Stress that the three ways of writing a number all stand for the same number. In assigning the page, give directions for drawing the place-value chart in their exercise books. Then assist them in doing several questions.

# Reading Numbers



## OBJECTIVES

- To recognize and write two-digit numbers
- To recognize "zero" as representing the number property of the "empty set"

## PACING

- Level A All
- Level B All
- Level C All

## VOCABULARY

unscramble

## MATERIALS

number and word cards (see Activity 3)

## SUGGESTIONS

**Initial Activity** Write these five numbers on the chalkboard and discuss with the class how each is written in words. Read the numbers aloud. Discuss the meaning of the 4 in each case.

Also have available, in sets of five, matching word and number cards, arranged in random order. Object is to match word cards to correct number cards.

|             |      |
|-------------|------|
| four        | — 4  |
| fourteen    | — 14 |
| thirty-four | — 34 |
| forty       | — 40 |
| forty-four  | — 44 |

## ACTIVITIES

1. Make a list of all the two-digit numbers you have in your life — address, birth date, number of children in your class, your height, the temperature, and so on.

2. **Letter Game** Have several "house shapes" cut out with a two-digit numeral printed on each. Make a set of "letters" with number words to correspond to the house numbers. The children can use this as a matching activity.

3. Make a set of matching cards for the set of numbers

- (a) 10-30
- (b) 30-50
- (c) 50-80.

|    |              |
|----|--------------|
| 23 | twenty-three |
|----|--------------|

Child is to match the cards. Play either as solitaire or rummy.

Can you unscramble these?

twenty

ninety      70      eighty      90      30  
 50      thirty      20      fifty      60  
 80      40      sixty      seventy      forty

Copy and match. 20 — twenty

Write the numerals.

- fourteen 14
- eighteen 18
- twelve 12
- sixteen 16
- nineteen 19
- eleven 11
- thirteen 13
- fifteen 15
- seventeen 17
- sixty-four 64
- twenty-five 25
- forty-two 42
- thirty-one 31
- ninety-six 96
- seventy-nine 79
- eighty-three 83

Reading 2-digit numbers 5

**Using the Book** Read, or have read, the numerals in each house and the corresponding words which go with them. Emphasize that the 0 in a number like 20 means "no ones" when the objects are grouped in tens and that zero is a placeholder.

Ask if each letter has been delivered to the correct house. For the unscrambling exercise, show the children that the first has been done in red for them. Be certain children know the accepted format for answering in their exercise books.

Answers:

30 - thirty      70 - seventy  
 40 - forty      80 - eighty  
 50 - fifty      90 - ninety  
 60 - sixty



## OBJECTIVES

To compare the value of one-digit and two-digit numbers  
To use correctly the symbols  $<$ ,  $>$ ,  $=$

## PACING

Level A 1-12  
Level B 1-6, 13-18  
Level C 1, 2, 4, 13-24

## VOCABULARY

$<$  is less than,  $>$  is greater than, comparing

## MATERIALS

a variety of counting materials and objects, such as stones, chestnuts, buttons, stir sticks, etc., some to be bundled in sets of ten, large  $>$ ,  $<$ , and  $=$  symbols on Bristol board, a variety of number cards up to 100

## RELATED AIDS

BFA COMP LAB I—43.

## BACKGROUND

When comparing numbers with 2 or more digits, we always start with the digit in the greatest place-value position, and continue with the next greatest place-value position, and so on. A good aid to help children remember  $<$  and  $>$ : "Greedy Gobbler" always opens his mouth to the larger number.

## SUGGESTIONS

- Initial Activities**
1. Ensure that the children understand the terms "less than, more than, equal" before presenting these symbols  $<$ ,  $>$ ,  $=$ .
  2. Assemble 2 small groups of children at the front of the room. Count the number of members in each group. Ask someone to come up and stand between the two groups and display the appropriate " $>$ ", " $<$ ", or " $=$ " symbol.
  3. Have the children hold a different number of objects (less than 10) in each hand. Question them as to which hand holds more.

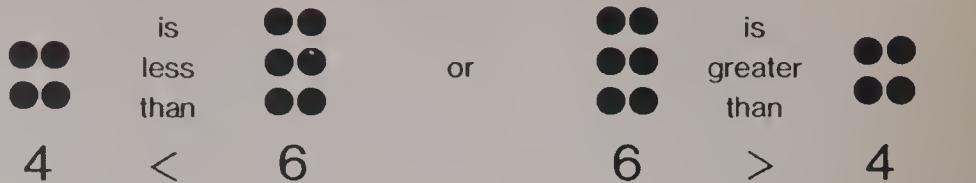
## ACTIVITIES

1. Use a selection of cards from a deck of number cards 0 to 100. Have the children pull two different numbers and indicate whether the first number is less than, more than, or equal to the second number drawn.
2. Have the children bring or cut pictures of groups of objects from magazines. They mount these for the bulletin board with the appropriate  $>$ ,

## Comparing Numbers

How many birds?

How many nests?



Copy and put  $<$  or  $>$  or  $=$  in the

- |                       |                       |                       |
|-----------------------|-----------------------|-----------------------|
| 1. 6 $\bullet$ 8 $<$  | 2. 5 $\bullet$ 5 $=$  | 3. 2 $\bullet$ 4 $<$  |
| 4. 9 $\bullet$ 7 $>$  | 5. 3 $\bullet$ 5 $<$  | 6. 6 $\bullet$ 4 $>$  |
| 7. 1 $\bullet$ 7 $<$  | 8. 9 $\bullet$ 8 $>$  | 9. 3 $\bullet$ 3 $=$  |
| 10. 6 $\bullet$ 5 $>$ | 11. 2 $\bullet$ 1 $>$ | 12. 7 $\bullet$ 8 $<$ |

Copy and complete.

- |                                       |  |   |
|---------------------------------------|--|---|
| 13. 4 $<$ $\blacksquare$ 5 or greater | 14. 7 $<$ $\blacksquare$ 8 or greater        | 15. 2 $<$ $\blacksquare$ 3 or greater                 |
| 16. 6 $<$ $\blacksquare$ 7 or greater | 17. 3 $=$ $\blacksquare$ 3                   | 18. 8 $<$ $\blacksquare$ 9 or greater                 |
| 19. 7 $=$ $\blacksquare$ 7            | 20. 3 $>$ $\blacksquare$ 0, 1, or 2          | 21. 9 $>$ $\blacksquare$ 0, 1, 2, 3, 4, 5, 6, 7, or 8 |
| 22. 2 $>$ $\blacksquare$ 0 or 1       | 23. 6 $>$ $\blacksquare$ 0, 1, 2, 3, 4, or 5 | 24. 5 $=$ $\blacksquare$ 5                            |

6 Less than, greater than, symbols

**Using the Book** Have the short sentences in display read and answered. Ask why two birds don't have places to land. (because the number of birds is greater than the number of nests) Show children that this situation is indicated using dots, symbols, and numerals.

Complete Exercises 1, 2, and 4 orally and on chalkboard. Have children check answers in back of book to see if the class was correct.

Point out to children that Exercises 1-12 require a symbol and that Exercises 13-24 require numerals.

## EXTRA PRACTICE

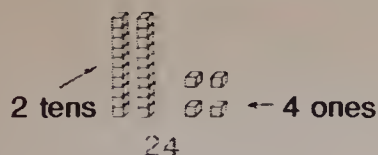
Use  $<$ ,  $>$ , or  $=$ .

- |                  |                  |
|------------------|------------------|
| 1. 7 $\bullet$ 4 | 2. 8 $\bullet$ 9 |
| 3. 4 $\bullet$ 4 | 4. 6 $\bullet$ 3 |
| 5. 2 $\bullet$ 9 | 6. 5 $\bullet$ 5 |

Copy and complete.

- |                         |                          |
|-------------------------|--------------------------|
| 7. 7 $<$ $\blacksquare$ | 8. 6 $>$ $\blacksquare$  |
| 9. 9 $=$ $\blacksquare$ | 10. 4 $<$ $\blacksquare$ |

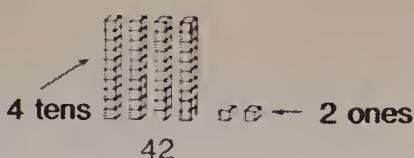
# Comparing Larger Numbers



24 has 2 tens.

42 is greater than 24.

$$42 > 24$$

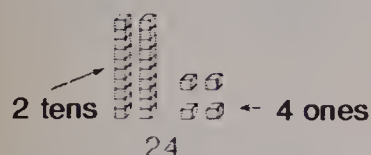


42 has 4 tens.

24 is less than 42.

$$24 < 42$$

42 has more tens



24 and 22 both have 2 tens.

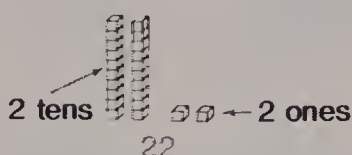
24 has 4 ones.

22 has 2 ones.

24 has more ones.

24 is greater than 22.

$$24 > 22$$



22 is less than 24.

$$22 < 24$$

## OBJECTIVE

To compare, using  $<$ ,  $>$ ,  $=$ , the value of two-digit numbers

## PACING

Level A 1-12

Level B 1-16

Level C 1-16

## MATERIALS

a variety of counting materials and objects, such as stones, chestnuts, buttons, stir sticks, etc., some to be bundled in sets of ten, large  $<$ ,  $>$ , and  $=$  symbols on Bristol board, a variety of number cards up to 100

## RELATED MATERIALS

HMS—DM2.

BFA COMP LAB I—4, 5, 18, 19, 44.

## SUGGESTIONS

**Initial Activity** Have the children compare numbers which are quite extreme — 23 and 71.

Then have the children make finer and finer distinctions in comparing numbers with the same numbers but in different relative positions — 32 and 23.

## ACTIVITIES

Besides activities suggested for page 6, be sure to see the "Numbers Game" in the Activity Reservoir.

## EXTRA PRACTICE

Which number has more tens? more ones?

1. 25 or 64      2. 43 or 51

3. 67 or 33      4. 27 or 84

5. 42 or 66      6. 57 or 91

Which number is greater?

7. 47 or 36      8. 37 or 43

9. 60 or 50      10. 21 or 31

Comparing 2-digit numbers 7

**Using the Book** Review, if necessary, the discussions and activities which arose from page 6. Panel 1: Point out to children, and/or demonstrate using cubes, that it is easy to see that a *group* of 42 is greater than a *group* of 24. Show them we can tell that the *number* 42 is larger than the *number* 24 by comparing the numeral in the ten's place. Because 42 has more tens, it is therefore greater than 24.

Panel 2: Ask the children what they notice about the number of tens in each group here. (They are the same.) Ask them what we should do to compare in this situation. (Go to the one's place.) Ask, "Which group pictured has more ones? (24)" "Therefore, which of the two numbers is the lesser? (22)" Indicate that this information has been written in panel 2.

Panel 3: Have instructions read for Exercises 1-4, 5-8, and 9-16. Be sure children are aware of the acceptable answer method. You may wish to do Exercises 1, 5, and 9 orally.



## OBJECTIVE

To review the addition of one-digit numbers with one-digit sums

## MATERIALS

various concrete objects, picture cards similar to those on pages 8 and 9

## RELATED AIDS

BFA COMP LAB I—8.

## SUGGESTIONS

**Initial Activity** Discuss the various number stories that can be given to a specific number like 5 ( $3 + 2$ ,  $2 + 3$ ,  $4 + 1$ , ...).

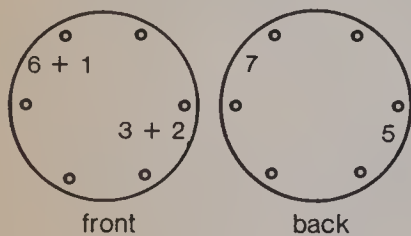
Encourage the children to use their concrete materials and record their findings.

Use the picture cards to show how number stories can be written pictorially. By turning the cards to a vertical orientation, you can convey to the children the idea of vertical addition.

## ACTIVITIES

1. Use dominoes as cards. The children "draw" a domino and write the corresponding number story.

2. Make up a set of cards for the basic facts using Bristol board cut into animal shapes or pie plates. The child puts a pencil through a hole, says the sum, and turns the card over where the answer is written beside the hole.

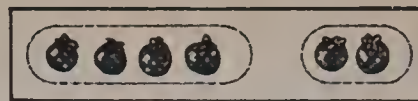


3. Make up a set of flash cards with the needed additions on the front and the sums on the back. Children can work in pairs or the teacher can work with small groups.

## EXTRA PRACTICE

1.  $6 + 3$
2.  $7 + 2$
3.  $4 + 5$
4.  $1 + 8$
5.  $2 + 6$
6.  $5 + 4$
7.  $1 + 4$
8.  $6 + 3$
9.  $3 + 4$
10.  $2 + 5$

## Number Stories



$$4 + 2 = 6$$

Write the number stories for the pictures.

1.  $3 + 3 = 6$

2.  $3 + 5 = 8$

3.  $4 + 3 = 7$

4.  $2 + 5 = 7$

5.  $5 + 3 = 8$

6.  $8 + 1 = 9$

7.  $2 + 2 = 4$

8.  $3 + 4 = 7$

Copy and complete.

- |                              |                              |                              |
|------------------------------|------------------------------|------------------------------|
| 9. $5 + 3 = \blacksquare$ 8  | 10. $3 + 2 = \blacksquare$ 5 | 11. $3 + 6 = \blacksquare$ 9 |
| 12. $7 + 2 = \blacksquare$ 9 | 13. $4 + 3 = \blacksquare$ 7 | 14. $8 + 1 = \blacksquare$ 9 |
| 15. $1 + 4 = \blacksquare$ 5 | 16. $2 + 6 = \blacksquare$ 8 | 17. $5 + 4 = \blacksquare$ 9 |

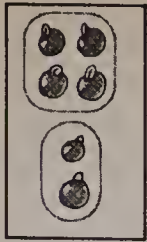
8 Addition of 1-digit numbers, 1-digit sums

**Using the Book** Indicate that we can write stories using not words but numbers to tell what is shown with pictures. In the display,  $4 + 2 = 6$  is the correct number story for the picture because 1 group of 4 tomatoes and 1 group of 2 tomatoes is the same as a group of 6 tomatoes.

Give explicit instructions on how the children are to record their answers in their exercise books. They should write the complete number sentence in a horizontal form for page 8.



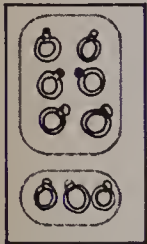
# Up and Down Number Stories



$$\begin{array}{r} 4 \\ +2 \\ \hline 6 \end{array}$$

You can write number stories up and down.

Write the number stories for these.

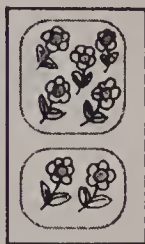


$$\begin{array}{r} 6 \\ +3 \\ \hline 9 \end{array}$$



$$\begin{array}{r} 4 \\ +4 \\ \hline 8 \end{array}$$

3.



$$\begin{array}{r} 5 \\ +2 \\ \hline 7 \end{array}$$

Complete these.

|   |   |   |   |   |
|---|---|---|---|---|
| $\begin{array}{r} 4 \\ +4 \\ \hline \blacksquare 8 \end{array}$ | $\begin{array}{r} 4 \\ +2 \\ \hline \blacksquare 6 \end{array}$ | $\begin{array}{r} 4 \\ +5 \\ \hline \blacksquare 9 \end{array}$ | $\begin{array}{r} 6 \\ +3 \\ \hline \blacksquare 9 \end{array}$ | $\begin{array}{r} 1 \\ +4 \\ \hline \blacksquare 5 \end{array}$ |
| $\begin{array}{r} 2 \\ +5 \\ \hline \blacksquare 7 \end{array}$ | $\begin{array}{r} 7 \\ +2 \\ \hline \blacksquare 9 \end{array}$ | $\begin{array}{r} 8 \\ +1 \\ \hline \blacksquare 9 \end{array}$ | $\begin{array}{r} 6 \\ +2 \\ \hline \blacksquare 8 \end{array}$ | $\begin{array}{r} 4 \\ +3 \\ \hline \blacksquare 7 \end{array}$ |
| $\begin{array}{r} 2 \\ +3 \\ \hline \blacksquare 5 \end{array}$ | $\begin{array}{r} 5 \\ +4 \\ \hline \blacksquare 9 \end{array}$ | $\begin{array}{r} 3 \\ +6 \\ \hline \blacksquare 9 \end{array}$ | $\begin{array}{r} 1 \\ +7 \\ \hline \blacksquare 8 \end{array}$ | $\begin{array}{r} 3 \\ +3 \\ \hline \blacksquare 6 \end{array}$ |

Vertical addition, one-digit sums 9

## OBJECTIVE

To review the vertical addition of one-digit numbers with one-digit sums

## PACING

Level A All  
Level B All  
Level C 7-14

## RELATED AIDS

BFA COMP LAB I—9.

## ACTIVITIES

1. Use Activity 1 from page 8, ensuring that children are clear that today's number stories must be "up and down".

2. Use Activity 2 from page 8 as a model. Provide materials (index cards or pie plates, single hole punch) and have children make up a similar activity "up and down style".

3. Provide a set of 6 to 8 pairs of cards, one showing a horizontal number story and the other the same number story vertically. Mix up cards and turn them face down on a desk. Object is for players (2 or 3) to take turns trying to find and match appropriate cards. Player to take most pairs is the winner.

4. See the "Patchwork Quilt" and "Missing Numbers" games in the Activity Reservoir.

## EXTRA PRACTICE

|  |  |
|--|--|
| $\begin{array}{r} 6 \\ +2 \\ \hline \end{array}$ | $\begin{array}{r} 3 \\ +5 \\ \hline \end{array}$ |
| $\begin{array}{r} 6 \\ +1 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ +5 \\ \hline \end{array}$ |
| $\begin{array}{r} 8 \\ +1 \\ \hline \end{array}$ | $\begin{array}{r} 5 \\ +4 \\ \hline \end{array}$ |
| $\begin{array}{r} 7 \\ +2 \\ \hline \end{array}$ | $\begin{array}{r} 3 \\ +4 \\ \hline \end{array}$ |
| $\begin{array}{r} 5 \\ +2 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ +1 \\ \hline \end{array}$ |

**Using the Book** Draw children's attention to the display. Ask, "What is the difference between what we see at the top of page 9 and what we see at the top of page 8?" Elicit that the information is the same but that page 9 shows it a different way (up and down).

Have the children write or copy the questions and write the answers in a vertical form. Each question should be numbered as in the text.

# OBJECTIVE

To illustrate the commutative property

# VOCABULARY

flip-flop

# MATERIALS

arm balance scale, transparent sheet, objects of the same mass (golf balls, nails, wooden blocks)

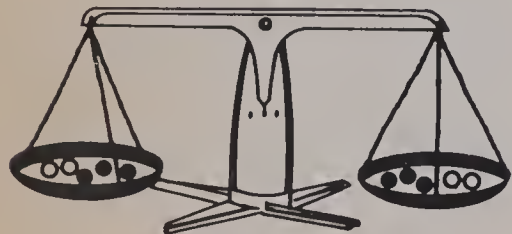
# RELATED AIDS

BFA COMP LAB I—15.

# SUGGESTIONS

**Initial Activity** Discuss these activities (and any others you can think of) to determine whether the order in which they are done is important: putting on shoes and socks (yes); turning on the tap and getting a drink (yes); eating eggs and bacon (no); brushing your teeth and combing your hair (no); adding  $4 + 2$  or  $2 + 4$  (no). Follow up examples of this last type with many opportunities for the children to make balanced sets on a balance scale.

Have the children record the objects used.



Now, record the objects on the transparent sheet using marking pens.



This sheet may be used on the overhead projector to show that the value of the set doesn't change when it is flipped over (just the order changes).

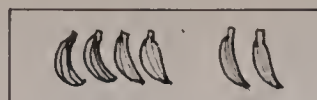
# ACTIVITIES

1. Have the children work in pairs and write "flip-flop" stories for each other. This work will provide a background for later work on symmetry.

2. Make butterflies with addition shown on one side. A set of cards cut to match the shapes on the second side have the flip-flop stories for the addition. Children are to place their cards properly. Discuss symmetry.

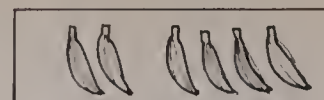
## Flip-Flop Stories

These are "Flip-Flop" stories. Why?



$$4 + 2$$

=



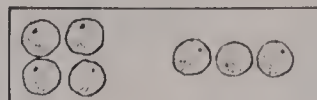
$$2 + 4$$

$$4 + 2 = 6$$

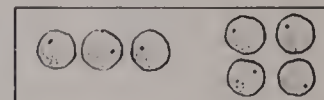
$$2 + 4 = 6$$

Write "Flip-Flop" stories for these.

1.



$$4 + 3$$



$$3 + 4$$

$$4 + 3 = 7$$

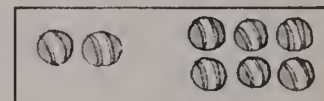
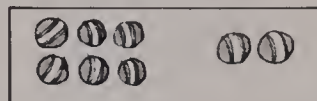
$$3 + 4 = 7$$

2.



$$3 + 5 = 5 + 3$$

3.



$$6 + 2 = 2 + 6$$

Are these "Flip-Flop" stories? (Yes or no)

4.  $3 + 2 = 2 + 3$  **yes**

5.  $4 + 2 = 3 + 4$  **no**

6.  $5 + 3 = 4 + 5$  **no**

7.  $3 + 4 = 4 + 3$  **yes**

Make the "Flip-Flop" stories for these.

8.  $4 + 3 =$  **3 + 4**

9.  $3 + 6 =$  **6 + 3**

10.  $2 + 5 =$  **5 + 2**

11.  $3 + 1 =$  **1 + 3**

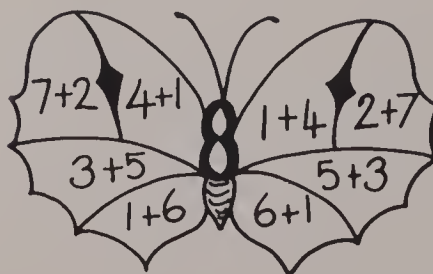
12.  $4 + 2 =$  **2 + 4**

13.  $4 + 5 =$  **5 + 4**

10 Commutative property

**Using the Book** Have the children look at and read the information in the display. Elicit answers to the question posed. (because there are 6 bananas in each group; that  $4 + 2$  is the same as  $2 + 4$ ; etc.) Point out that "flip" is the same as "flop".

Complete Exercises 2, 4, and 8 orally, showing the children the method in which you would like them to respond in their workbooks.



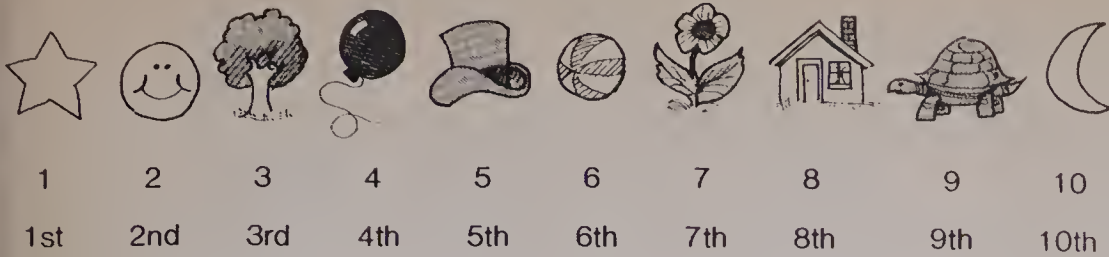
3. A game may be played using:

$$\square + \bigcirc = \bigcirc + \square$$

The children are given one minute to write as many flip-flop stories as they can whose sum is a given number such as 9, or 8, etc.



# Things in Order



Copy and write the **short way**.

1. fourth — 4th    2. tenth    10th    3. seventh    7th    4. first    1st  
 5. ninth    9th    6. fifth    5th    7. second    2nd    8. sixth    6th  
 9. third    3rd    10. eighth    8th

Where are they? Copy and complete.

11. The is 3rd.    12. The is 10th.    13. The is 9th.  
 14. The is 5th.    15. The is 2nd.    16. The is 4th.  
 17. The is 8th.    18. The is 1st.    19. The is 7th.

How many letters? Where are they? **26 letters**

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| a | b | c | d | e | f | g | h | i | j | k | l | m | n | o | p | q | r | s | t | u | v | w | x | y | z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

20. The **m** is 13th.    21. The **k** is 11th.    22. The **r** is 18th.    23. The **z** is 26th.

Ordinal numbers 11

**Using the Book** Referring to the display, point out that the top row of numbers is used to count the objects and the second row of numbers is used to show the order of the objects.

Point out to the children that Exercise 1 has been done already and that this shows how the exercises should be completed in their workbooks. This is also the case with Exercises 11 and 20. You may wish to do Exercises 2-4, 12, and 13 orally, or simply assign the exercises and allow the children to check these answers themselves to ensure they are on the right track.

Exercises 20-23 will require extra care. These exercises go beyond what was formally introduced in the display.

## OBJECTIVE

To use ordinal numbers to represent the position of an object in an ordered set

## PACING

Level A 1-19  
 Level B All  
 Level C All

## VOCABULARY

the order words first to tenth

## MATERIALS

a collection of 30 different objects

## BACKGROUND

The counting numbers are called *cardinal* numbers; the ordering numbers are called *ordinal* numbers.

## SUGGESTIONS

**Initial Activity** Have the children arrange the objects in any order. Discuss the position of a specific object — “What is 4th in the row?”

Have ten children line up and repeat the above — “Who is sixth in the row?”

Using the chalkboard establish the connection between the word form and the shortened number and word form of the ordinals: fourth → 4th (relate to work in phonics).

Relate to the daily routine of discussing the date, i.e., 23rd of July, or the 23rd of the seventh month.

## ACTIVITIES

1. Make a chart for all the birthdays in the class. List all those born in the first month (January), and so on — correlate to pictographs.

2. Prepare word cards and ordinal numbers for 1st to 20th. Also prepare activity cards with events such as: I get up; eat breakfast; walk to school; have recess; have math; etc. Children are to match the two sets of cards.

*Extension:* Extend cards to 30th.

3. Read a short, familiar story. Prepare a set of cards with the main events on them. Children are to order the cards.



## OBJECTIVE

To find sums using an addition table

## PACING

Level A 12 All

13 1-8

Level B 12 All

13 3-10

Level C 12 Optional

13 5-10

## VOCABULARY

column, row

## MATERIALS

individual addition charts for colouring, an addition table for demonstration purposes (overhead transparency, chalkboard, or large-chart format)

This should be colour coded to match the one in the textbook.

## RELATED AIDS

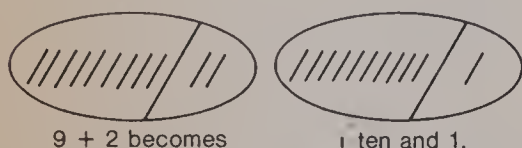
BFA COMP LAB I—8-11.

## ACTIVITIES

1. Prepare plasticized cards (or dittoed sheets).

$9 + 2 = \underline{\quad}$  tens and  $\underline{\quad}$  ones  
 $5 + 6 = \underline{\quad}$  tens and  $\underline{\quad}$  ones  
 etc.

If they need to, children should put counters on a prepared counting board.



2. Provide an addition chart and a card which states: "Make up a treasure map for a friend to follow. Have your friend colour the squares that answer your questions and discover the treasure."

Example  $1 + 1$   
 $2 + 1$   
 $3 + 2$   
 $3 + 3$   
 $4 + 2$   
 $5 + 2$   
 $5 + 3$   
 $2 + 0$   
 $6 + 1$   
 $7 + 0$

"The treasure is a dog."

## Addition Chart

This is an addition chart.

It can help you to do your number stories.

| + | 0 | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  |
|---|---|----|----|----|----|----|----|----|----|----|
| 0 | 0 | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  |
| 1 | 1 | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 |
| 2 | 2 | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 |
| 3 | 3 | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 |
| 4 | 4 | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 |
| 5 | 5 | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 |
| 6 | 6 | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 |
| 7 | 7 | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 8 | 8 | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| 9 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |

1. Find one number in the red row.
2. Find the other number in the blue column.
3. Go down from the number in the red row.
4. Go across from the number in blue.
5. The answer is in the box where the two number paths meet.

$$5 + 4 = 9$$

12 One- and two-digit sums

**Using the Book** Take the children through the 5 steps on page 12 showing the child how to write the answers in both the horizontal and vertical formats so the children can work on page 13 independently. Indicate that the questions on page 13 are to be copied and completed. Question numbers are to be written for each, for example, 5(c).

If the children have difficulty in reading the chart, cut out a square with an arrow in the corner and have the child place the sides of the square along the right number row and column. The arrow will point to the correct answer.



This could be correlated to a pirate "treasure hunt" — follow the directions and you'll find the "treasure".

| + | 0 | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  |
|---|---|----|----|----|----|----|----|----|----|----|
| 0 | 0 | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  |
| 1 | 1 | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 |
| 2 | 2 | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 |
| 3 | 3 | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 |
| 4 | 4 | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 |
| 5 | 5 | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 |
| 6 | 6 | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 |
| 7 | 7 | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 8 | 8 | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| 9 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |

3. See "The Facts Machine" and "Missing Numbers" games in the Activity Reservoir.

Use your addition chart to help you do these.

1. (a)  $3 + 4 = \blacksquare 7$  (b)  $5 + 2 = \blacksquare 7$  (c)  $2 + 3 = \blacksquare 5$  (d)  $4 + 4 = \blacksquare 8$
2. (a)  $6 + 2 = \blacksquare 8$  (b)  $2 + 2 = \blacksquare 4$  (c)  $1 + 7 = \blacksquare 8$  (d)  $7 + 2 = \blacksquare 9$
3. (a)  $3 + 6 = \blacksquare 9$  (b)  $4 + 5 = \blacksquare 9$  (c)  $0 + 0 = \blacksquare 0$  (d)  $8 + 1 = \blacksquare 9$
4. (a)  $6 + 1 = \blacksquare 7$  (b)  $5 + 3 = \blacksquare 8$  (c)  $3 + 3 = \blacksquare 6$  (d)  $7 + 8 = \blacksquare 15$

Complete these.

5. (a)  $\begin{array}{r} 5 \\ +3 \\ \hline 8 \end{array}$  (b)  $\begin{array}{r} 2 \\ +4 \\ \hline 6 \end{array}$  (c)  $\begin{array}{r} 3 \\ +8 \\ \hline 11 \end{array}$  (d)  $\begin{array}{r} 9 \\ +9 \\ \hline 18 \end{array}$  (e)  $\begin{array}{r} 6 \\ +7 \\ \hline 13 \end{array}$  (f)  $\begin{array}{r} 6 \\ +6 \\ \hline 12 \end{array}$
6. (a)  $\begin{array}{r} 7 \\ +5 \\ \hline 12 \end{array}$  (b)  $\begin{array}{r} 6 \\ +4 \\ \hline 10 \end{array}$  (c)  $\begin{array}{r} 3 \\ +9 \\ \hline 12 \end{array}$  (d)  $\begin{array}{r} 6 \\ +5 \\ \hline 11 \end{array}$  (e)  $\begin{array}{r} 8 \\ +9 \\ \hline 17 \end{array}$  (f)  $\begin{array}{r} 3 \\ +7 \\ \hline 10 \end{array}$
7. (a)  $\begin{array}{r} 8 \\ +6 \\ \hline 14 \end{array}$  (b)  $\begin{array}{r} 8 \\ +8 \\ \hline 16 \end{array}$  (c)  $\begin{array}{r} 7 \\ +4 \\ \hline 11 \end{array}$  (d)  $\begin{array}{r} 5 \\ +9 \\ \hline 14 \end{array}$  (e)  $\begin{array}{r} 6 \\ +3 \\ \hline 9 \end{array}$  (f)  $\begin{array}{r} 0 \\ +1 \\ \hline 1 \end{array}$
8. (a)  $\begin{array}{r} 9 \\ +2 \\ \hline 11 \end{array}$  (b)  $\begin{array}{r} 8 \\ +4 \\ \hline 12 \end{array}$  (c)  $\begin{array}{r} 7 \\ +7 \\ \hline 14 \end{array}$  (d)  $\begin{array}{r} 8 \\ +5 \\ \hline 13 \end{array}$  (e)  $\begin{array}{r} 4 \\ +8 \\ \hline 12 \end{array}$  (f)  $\begin{array}{r} 7 \\ +6 \\ \hline 13 \end{array}$
9. (a)  $\begin{array}{r} 4 \\ +9 \\ \hline 13 \end{array}$  (b)  $\begin{array}{r} 9 \\ +6 \\ \hline 15 \end{array}$  (c)  $\begin{array}{r} 9 \\ +8 \\ \hline 17 \end{array}$  (d)  $\begin{array}{r} 8 \\ +7 \\ \hline 15 \end{array}$  (e)  $\begin{array}{r} 9 \\ +7 \\ \hline 16 \end{array}$  (f)  $\begin{array}{r} 8 \\ +2 \\ \hline 10 \end{array}$
10. (a)  $\begin{array}{r} 5 \\ +5 \\ \hline 10 \end{array}$  (b)  $\begin{array}{r} 6 \\ +8 \\ \hline 14 \end{array}$  (c)  $\begin{array}{r} 9 \\ +5 \\ \hline 14 \end{array}$  (d)  $\begin{array}{r} 8 \\ +3 \\ \hline 11 \end{array}$  (e)  $\begin{array}{r} 6 \\ +9 \\ \hline 15 \end{array}$  (f)  $\begin{array}{r} 2 \\ +8 \\ \hline 10 \end{array}$

## OBJECTIVE

To solve problems in addition with no regrouping

## PACING

Level A All  
Level B All  
Level C All

## VOCABULARY

mysteries

## MATERIALS

various concrete objects — cookies, hockey cards, marbles

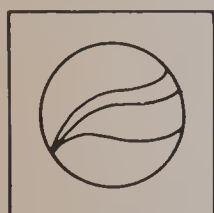
## BACKGROUND

In each of the problem-solving sections of this book we want to emphasize the operation necessary to get the answer: addition, subtraction, multiplication, or division. For addition we “put together”, “combine”, “collect”, etc. Discuss these “doing” ideas in each problem-solving situation.

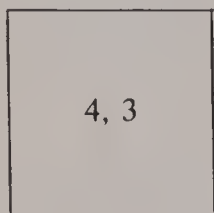
## ACTIVITIES

1. Have two sets of cards — one set with pictures of different objects on them and one set with two one-digit numbers. The children draw a picture card and a number card and must make up a “mystery” for a friend to solve.

*Example*



marbles



Solution: “Jane had 4 marbles.  
Tom had 3 marbles.  
Together they had  
7 marbles.”

2. Prepare a set of problem cards with pictures (or have children write problems on cards).

*Example* How do I get a kite out of a tree?

A car is stuck in a snow bank.

How do I get a zipper unstuck?

My bicycle has a flat tire.

The child is to write or draw pictures of how to solve the problem.

3. Present the children with a picture. Each child is to write a question about the picture — on a card. The questions are exchanged.

## Mystery Fun



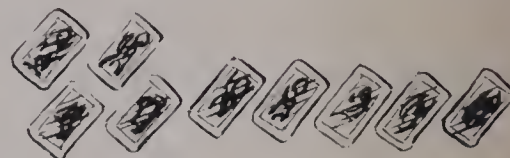
Find the answers to these mysteries.

1. Mary ate 4 cookies.  
Then she ate 2 more cookies.  
How many cookies did she eat?



4 is the number of cookies she ate first.  
+ 2 is the number of cookies she ate next.  
6 is the number of cookies she ate altogether.

2. Bob had 2 hockey cards.  
He was given 7 more.  
How many cards does he have?



2 is the number of cards he had.  
+ 7 is the number of cards he was given.  
9 is the number of cards he has now.

3. Jane had 3 marbles.  
She won 5 more.  
How many marbles does she have now?



3 is the number of marbles she had.  
+ 5 is the number of marbles she won.  
8 is the number of marbles she has now.

### 14 Reading word problems

**Using the Book** Using the easily procured objects suggested, demonstrate the problems on page 14. Discuss the elements of each problem and why it is necessary to include all of these elements.

Emphasize that since we are “putting together” or combining items, we add to get the answer.

Have the children suggest other similar problems.

You may find it preferable to call problems “mysteries” as they are less likely then to be a “problem” to the children.

Note: The child should not be expected to copy all the sentences in this exercise.





## OBJECTIVE

To solve word problems with pictures in addition with no regrouping

## PACING

Level A All

Level B All

Level C All

## MATERIALS

bottle caps, buttons, clothes pins, poker chips, cubes of various colours

## SUGGESTIONS

### Initial Activity

Play act with a child.

Give Jimmy 5 bottle caps.

Write a sentence on the chalkboard:

"Jimmy has 5 bottle caps."

Give him 2 more caps and write a sentence:

"Jimmy is given 2 more bottle caps."

Write the question:

"How many bottle caps does Jimmy have?"

Indicate the putting together means we add.

Write the number story two ways.

Conclude with a sentence:

"Jimmy has 7 bottle caps now."

## ACTIVITIES

1. Children working in pairs are given a set of objects such as buttons or clothes pins. The first child makes up a problem illustrated by the buttons. The second child has to write a number story to solve the problem.

$$\begin{array}{c} \textcircled{\cdot\cdot} \quad \textcircled{\cdot\cdot} \quad \textcircled{\cdot\cdot} \quad \textcircled{\cdot\cdot} \quad \textcircled{\cdot\cdot} \\ \textcircled{\cdot\cdot} \quad \textcircled{\cdot\cdot} \quad \textcircled{\cdot\cdot} \end{array} \quad \begin{array}{r} 5 \\ + 3 \\ \hline 8 \end{array}$$

Then the children reverse roles.

2. The children may take turns pantomiming or play acting problems. Others tell what they are doing and write a number story for the problem.

3. Ask the children to do the 6 problems on this page using different numbers. The numbers should be 10 or less.

## More Mysteries

1. Jane has 6 apples.  
Tina has 2 apples.



How many apples do both girls have?

$$\begin{array}{r} 6 \\ + 2 \\ \hline 8 \end{array}$$

2. John has 4 cars.  
Tom has 4 cars.



How many cars do they have altogether?

$$\begin{array}{r} 4 \\ + 4 \\ \hline 8 \end{array}$$

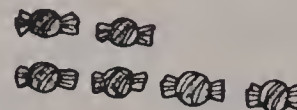
3. Susan has 3 balloons.  
Jane gave her 3 more.



How many balloons does Susan have now?

$$\begin{array}{r} 3 \\ + 3 \\ \hline 6 \end{array}$$

4. Ted ate 2 candies.  
Then he ate 4 more.



How many candies did he eat?

$$\begin{array}{r} 2 \\ + 4 \\ \hline 6 \end{array}$$

5. Maria had 5 marbles.  
She found 4 more.



How many marbles does she have now?

$$\begin{array}{r} 5 \\ + 4 \\ \hline 9 \end{array}$$

6. Tom picked 6 flowers.  
Then he picked 4 more.



How many flowers does he have now?

$$\begin{array}{r} 6 \\ + 4 \\ \hline 10 \end{array}$$

16 Word problems

**Using the Book** Direct the children to write an up and down number story to solve each problem. Discuss the first problem and the example of how to solve it. Ask the children which number goes in the box.

As with page 14, be sure that the children are aware that they do not have to copy out each problem. They should be reminded though, of the answer format which is used by the class.



# Hockey Cards

John had 24 hockey cards.  
He counted 2 sets of 10 and put elastics around them.  
He had 4 left.

He won 3 more at school.  
How many does he have now?

| tens | ones |          |
|------|------|----------|
| 2    | 4    | → 24     |
|      | 3    | → + 3    |
|      |      | <hr/> 27 |

John has 27 cards.

Copy and complete.

- |   |   |   |   |   |
|---|---|---|---|---|
| 1. $\begin{array}{r} 36 \\ + 2 \\ \hline 38 \end{array}$  | 2. $\begin{array}{r} 30 \\ + 8 \\ \hline 38 \end{array}$  | 3. $\begin{array}{r} 12 \\ + 5 \\ \hline 17 \end{array}$  | 4. $\begin{array}{r} 16 \\ + 1 \\ \hline 17 \end{array}$  | 5. $\begin{array}{r} 10 \\ + 6 \\ \hline 16 \end{array}$  |
| 6. $\begin{array}{r} 43 \\ + 5 \\ \hline 48 \end{array}$  | 7. $\begin{array}{r} 21 \\ + 6 \\ \hline 27 \end{array}$  | 8. $\begin{array}{r} 52 \\ + 4 \\ \hline 56 \end{array}$  | 9. $\begin{array}{r} 23 \\ + 4 \\ \hline 27 \end{array}$  | 10. $\begin{array}{r} 11 \\ + 7 \\ \hline 18 \end{array}$ |
| 11. $\begin{array}{r} 52 \\ + 6 \\ \hline 58 \end{array}$ | 12. $\begin{array}{r} 73 \\ + 6 \\ \hline 79 \end{array}$ | 13. $\begin{array}{r} 94 \\ + 4 \\ \hline 98 \end{array}$ | 14. $\begin{array}{r} 84 \\ + 3 \\ \hline 87 \end{array}$ | 15. $\begin{array}{r} 32 \\ + 5 \\ \hline 37 \end{array}$ |
| 16. $\begin{array}{r} 5 \\ + 24 \\ \hline 29 \end{array}$ | 17. $\begin{array}{r} 3 \\ + 62 \\ \hline 65 \end{array}$ | 18. $\begin{array}{r} 2 \\ + 45 \\ \hline 47 \end{array}$ | 19. $\begin{array}{r} 6 \\ + 32 \\ \hline 38 \end{array}$ | 20. $\begin{array}{r} 4 \\ + 45 \\ \hline 49 \end{array}$ |

2-digit addend + 1-digit addend 17

**Using the Book** Illustrate the display using actual cards to demonstrate the problem. Record numerically what was done with the cards using graph paper (to keep the numbers aligned) or place-value charts.

Have the children suggest other situations and repeat the same procedure. The teacher must ensure that the situations involve no regrouping, at this time.

3. Make and ditto this chart.  
Child is to fill in the missing numbers.

| + | 4 | 11 | 23 | 42 | 14 |
|---|---|----|----|----|----|
| 2 |   |    |    | 44 |    |
| 4 |   | 15 |    |    |    |
| 1 |   |    |    |    |    |
| 5 |   |    | 28 |    |    |
| 3 |   |    |    |    |    |

## OBJECTIVE

To find the sum of a two-digit addend and a one-digit addend with no regrouping

## PACING

Level A All  
Level B All  
Level C All

## VOCABULARY

elastics

## MATERIALS

place-value charts dittoed in quantity (or use graph paper), hockey cards and chalk or crayons of two colours, elastics

## RELATED AIDS

HMS—DM2 and DM4.  
BFA COMP LAB I—16.

## SUGGESTIONS

**Initial Activity** Ask a child to display 12 yellow crayons and 6 blue crayons. Draw a place-value chart on the chalkboard.

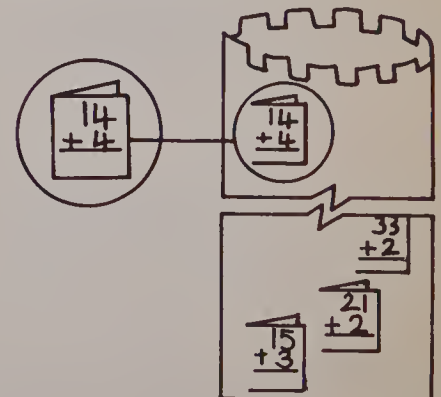
Write in this chart the number of yellow crayons.

Write the number of blue crayons. Then show how to add in this chart and how to add in the usual format. Ask, "How many are there altogether?"

Point out that Exercise 1 has been done already. Exercises 2 and 3 may be done orally, and answers for these two are in the back of the book.

## ACTIVITIES

1. Prepare "Climb The Tower". Each window is cut to open and has the answer written on the backside. On each window is an addition question similar to those on page 17.



2. Use the abacus from Activity 2, page 15, to add each.

|  |   |   |   |   |
|--|---|---|---|---|
| $\begin{array}{r} 37 \\ + 2 \\ \hline \end{array}$ | $\begin{array}{r} 47 \\ + 12 \\ \hline \end{array}$ | $\begin{array}{r} 54 \\ + 23 \\ \hline \end{array}$ | $\begin{array}{r} 23 \\ + 16 \\ \hline \end{array}$ | $\begin{array}{r} 34 \\ + 24 \\ \hline \end{array}$ |
|--|---|---|---|---|



OBJECTIVE

To count by 2's

PACING

- Level A 1-9
- Level B All
- Level C 4-13

VOCABULARY

pattern

MATERIALS

objects for grouping by 2's — paper clips, bread clasps, gummed shapes

RELATED AIDS

BFA COMP LAB I—25.

SUGGESTIONS

**Initial Activity** Discuss what comes in twos. Make a chart story or a collection of pictures of things that come in 2's. Attach paper clips together by 2's and put them in a box. Have the children take out some and count them by twos. Encourage the children to use other materials and repeat the same procedure.

To help the children look for patterns in counting by 2's, have the children substitute a clap instead of saying a specific number — "Clap instead of saying any number that has a 4 in it. (2, clap, 6, 8, 10, 12, clap, 16, 18, and so on.)"

This can be repeated with the other numbers used repeatedly in counting by 2's.

ACTIVITIES

1. Have the children make a collection of things that come in twos, and then write a poem or story about them.
2. [2 4 6 8 10] Put these numbers inside a box drawn on a page.

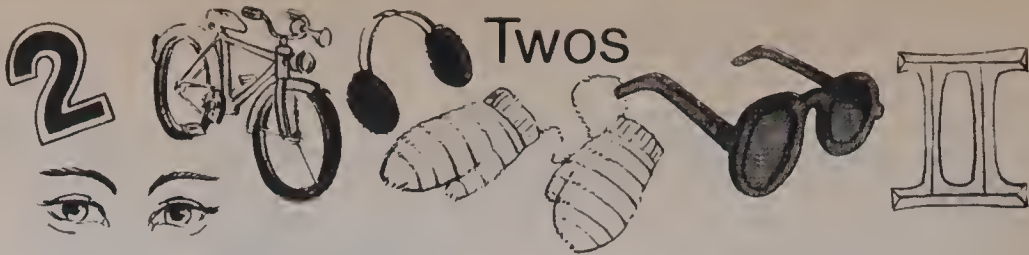
Ask, "Which of these numbers below could also go in the box? Why?"

- 13 16 24 12 15 17 14  
23 18 19 20 22

3. Place on the floor footprints (see Activity 3, page 1) numbered to 30. Children say each number as they step on 2, 4, 6, 8, etc.

*Extension:*

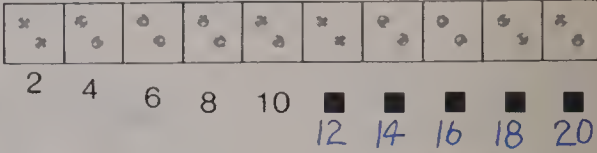
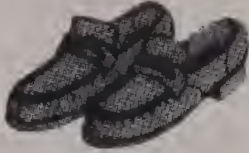
Start with 1, 3, 5, 7, etc. Child says the numbers.



1. Make a "number strip".



Put 2 counters in each part of the number strip. Count by 2's.



2. Write the numerals and finish the pattern.

3. What is the pattern?

Which numerals do you use over and over again?

2 4 6 8 0



Copy and complete.

- |                                    |                                    |
|------------------------------------|------------------------------------|
| 4. 2, 4, 6, ■, ■, ■ 8, 10, 12      | 5. 30, 32, ■, ■, ■ 34, 36, 38      |
| 6. ■, ■, ■, 10, 12, 14 4, 6, 8     | 7. ■, ■, ■, 14, 16, 18 8, 10, 12   |
| 8. 10, 12, 14, ■, ■, ■ 16, 18, 20  | 9. 40, 42, 44, ■, ■, ■ 46, 48, 50  |
| 10. ■, ■, ■, 22, 24, 26 16, 18, 20 | 11. ■, ■, ■, 38, 40, 42 32, 34, 36 |
| 12. 20, 22, 24, ■, ■, ■ 26, 28, 30 | 13. 50, 52, 54, ■, ■, ■ 56, 58, 60 |

18 Counting by twos

**Using the Book** Direct the children's attention to the title of this page and the artwork at the top and sides. Ask, "How are all these things the same? (They all picture or show 'two'.)" Have children tell specific objects shown that are in twos. (mitts, eyes, feet, etc.) Complete Exercise 1 orally before it is assigned as an activity. Be sure that children can see that Exercises 1-3 are related (refer to each other). Children should be advised of the correct answer format.

Exercises 4 and 5 should also be done orally to demonstrate what the children are expected to do.

EXTRA PRACTICE

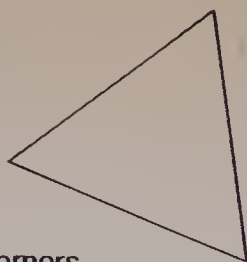
Copy and complete.

1. 66, 68, ■, ■, 74, ■
2. 74, 76, ■, ■, ■, ■
3. 88, ■, ■, ■, ■, 98
4. 90, 92, ■, ■, ■, ■

# Threes

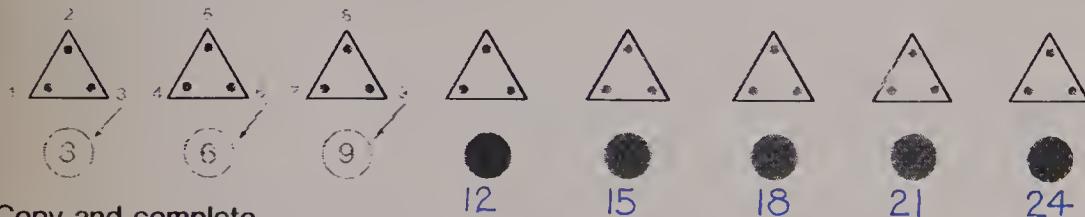
1. Take a triangle.

How many **corners** does it have? 3



2. Draw some triangles.

Put a dot on each **corner** and write the number of corners under your pictures like this.



Copy and complete.

3, 6, 9, ■, ■, ■ 12, 15, 18

18, 21, 24, ■, ■, ■ 27, 30, 33

5. ■, ■, ■, 12, 15, 18 3, 6, 9

6. ■, ■, ■, 24, 27, 30 15, 18, 21

7. 9, 12, 15, ■, ■, ■ 18, 21, 24

8. 24, 27, 30, ■, ■, ■ 33, 36, 39

9. ■, ■, ■, 21, 24, 27 12, 15, 18

10. ■, ■, ■, 39, 42, 45 30, 33, 36

11. 15, 18, 21, ■, ■, ■ 24, 27, 30

12. 30, 33, 36, ■, ■, ■ 39, 42, 45

13. ■, ■, ■, 15, 18, 21 6, 9, 12

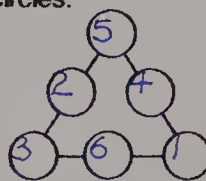
14. ■, ■, ■, 42, 45, 48 33, 36, 39

## BRAINTICKLER

Place these numbers in circles:

1, 2, 3, 4, 5, 6.

Make each side of the shape add up to 10.



Counting by threes 19

## OBJECTIVE

To count by 3's

## PACING

Level A 1-10

Level B 2-10

Level C 3-14

## VOCABULARY

corner

## MATERIALS

beads, pipe cleaners, triangles

## SUGGESTIONS

**Initial Activity** Discuss things that come in threes. Attach some things together in groups of three (3 beads on a pipe cleaner). Repeat the same procedures as outlined for counting by twos.

Encourage the children to look for number patterns in counting by 3's.

Relate to work on themes ("Three Bears", "The Three Little Pigs", etc.).

## ACTIVITIES

1. Have each child prepare a pipe cleaner ring with 3 beads on it. Children take turns counting all the beads by threes as another child writes the numbers on the chalkboard.

2. Put these numbers inside a box drawn on a piece of paper.

9 6 12 3 18

Ask, "Which of these numbers can you also put in the box? Why?" 21, 16, 18, 27, 33, 34, 42, 15, 22, 30, 28, 35

3. Using a deck of number cards, children pick out all cards and place them in order for counting by threes.

**Using the Book** Draw the children's attention to the sentences in Exercise 1 and the drawing of the large triangle. Have someone answer the question orally. Show children that Exercise 2 has been started already. Challenge them to complete it, either in their workbooks or on a copy which has been prepared on the chalkboard.

Exercises 3 and 4 could also be done orally to demonstrate what response is expected for the remaining exercises.

Some children may wish to attempt the Braintickler. Tell them there is more than one correct answer.



## OBJECTIVE

To recognize odd and even numbers

## PACING

Level A 1-3

Level B 1-3

Level C All

## VOCABULARY

odd, even, mountain

## MATERIALS

various concrete materials that can be grouped by twos

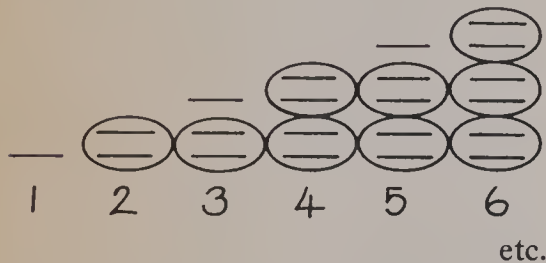
## RELATED AIDS

HMS—DM5.

BFA COMP LAB I—7.

## SUGGESTIONS

**Initial Activity** 1. On the chalkboard draw:



Show that some have twos only by circling in twos, and some have an extra one left over. Point out that those with a “one” left over are *odd* numbers and those with only twos are *even* numbers. Have the child continue this pattern. Ask where this pattern of even numbers appeared before (counting by 2's).

2. Practise counting by 2's.

## ACTIVITIES

1. Classify numbers used in the classroom as odd or even — number of girls, boys, texts, and so on.

2. Examine the system of numbering houses in the local community.

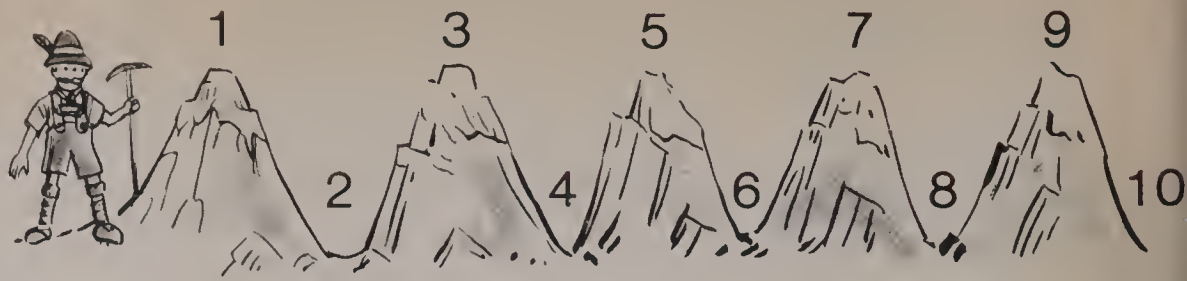
3. Prepare activity cards with suggestions like: “Find the word ‘math’ in the classroom dictionary. What page number? — odd or even?” “Today’s date — odd or even?” “Our classroom door number — odd or even?” “Your phone number — how many odd numbers? how many even numbers?” “How many in the class today? — odd or even?”

## EXTRA PRACTICE

*Extension:*

1. Write the numbers 40 to 60.  
Draw rings around the even numbers.

## Odds and Evens



The numbers at the mountain tops are **odd numbers**.

The numbers in the valleys are **even numbers**.

1. Write the **odd numbers**. 1, 3, 5, 7, 9

2. Write the **even numbers**. 2, 4, 6, 8, 10

3. Name each “odd” or “even”.

|         |       |        |         |        |
|---------|-------|--------|---------|--------|
| 5 — odd | 3 odd | 8 even | 4 even  | 2 even |
| 6 even  | 9 odd | 7 odd  | 10 even | 1 odd  |

★4. How are you counting if you use only the **even** numbers? *by twos*  
**odd** numbers? *by twos*

★5. Draw a long line of mountains and valleys.

Write odd and even numbers as far as you can. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, ...

What numbers are used over and over again? 1, 2, 3, 4, 5, 6, 7, 8, 9, 0

20 Odd and even numbers

**Using the Book** Say, “Look at the display. What pattern do you see in the numbers? (Discuss to bring out the idea of odds and evens.)” Say, “Draw a set of mountains and valleys as in the display. Number the peaks and valleys. Continue to 30.” Then, “Draw rings around each even number. What pattern do you see in the numbers? (2, 4, 6, 8, 10, repeat) What pattern do you see in the odd numbers? (1, 3, 5, 7, 9, repeat in order)” In assigning the page, note that Exercises 4 and 5 may be used as a point of discussion to summarize the point of the page. You may also want to ask, “In doing these exercises, were we working on an odd-numbered or even-numbered page?”

Draw squares around the odd numbers.

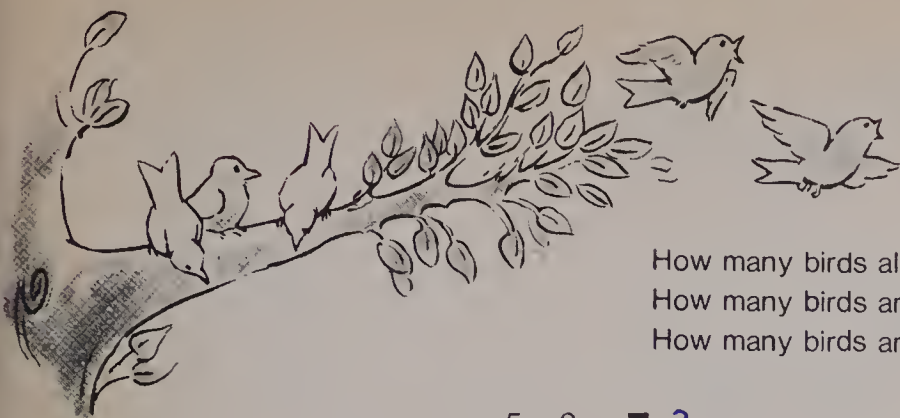
2. Write the numbers 85 to 100.

Draw rings around the even numbers.

Draw squares around the odd numbers.



# Subtraction Stories



How many birds altogether?  
How many birds are flying away?  
How many birds are left?

$$5 - 2 = \blacksquare 3$$

The number of birds that are left is called the **difference**.

Subtract to find the difference.

|    |  |                          |    |  |                          |
|----|--|--------------------------|----|--|--------------------------|
| 1. |  | $6 - 2 = \blacksquare 4$ | 2. |  | $8 - 3 = \blacksquare 5$ |
| 3. |  | $4 - 2 = \blacksquare 2$ | 4. |  | $5 - 1 = \blacksquare 4$ |
| 5. |  | $7 - 4 = \blacksquare 3$ | 6. |  | $5 - 3 = \blacksquare 2$ |
| 7. |  | $3 - 1 = \blacksquare 2$ | 8. |  | $6 - 3 = \blacksquare 3$ |

Subtraction concept 21

**Using the Book** Have the children view the display. Have each question read aloud and answered by members of the class. Point out that  $5 - 2 = 3$  "tells the story" of what happened in the picture using numerals and symbols. Have the final display sentence read and ask, "What number tells the difference? (3)"

For Exercise 1, ask, "How many spots on the egg? (6)"  
"How many spots crossed off? (2)"  
"How many spots left? (4)"  
"Copy and complete the number sentence."

## ACTIVITIES

### Pick a Domino

1. Have the children pick a domino and write an appropriate subtraction sentence(s) to match it.

*Example*



$$\begin{array}{r} 9 \text{ (total number of dots)} \\ - 3 \text{ (dots on one side)} \\ \hline 6 \end{array}$$

or

$$\begin{array}{r} 9 \\ - 6 \\ \hline 3 \end{array}$$

By using regular dominoes, basic subtraction facts up to 12 can be reviewed.

2. Guide groups of children to dramatize subtraction situations. Have one or more children write number stories, two ways, on the chalkboard for each situation. Ask one child to describe the action that takes place.

3. Show children the "Subtraction Mystery" game. Show a large tin can (empty tomato juice) or box. Place a number of small objects inside (cubes, candies, cookies, peanuts) so that everyone knows number of contents. Have someone take can from room, secretly remove a mystery number of objects, and return. Recount contents publicly. Represent the mystery on the board (e.g.,  $9 - \blacksquare = 3$ ). Ask children to "solve the mystery" by finding the unknown. Check with the participant for verification.

## OBJECTIVES

To review the concept of subtraction  
To introduce the term  
"difference"

## PACING

Level A All

Level B All

Level C All

## VOCABULARY

subtraction, difference

## MATERIALS

picture cards of dot patterns,  
dominoes, beads

## RELATED AIDS

HMS—DM6.

BFA COMP LAB I—46.

## BACKGROUND

Subtraction is the inverse operation of addition. Addition is the "putting together" and subtraction is the "separating" or the "taking away of part". Addition is the "doing" and subtraction is the "undoing". This concept will be promoted in the displays and problem pages.

## SUGGESTIONS

**Initial Activity** Play act with a child. Provide Jill with 9 beads. Write "9" on the chalkboard.

Take 6 beads away from Jill. Write "-6" under the 9.

Ask, "How many beads does Jill have now?"

Write the answer.

Write the number story in the horizontal form also.

Ask, "What action illustrates subtraction?" (we took something away).

Repeat this procedure for several subtraction facts.

Do several examples using dot pattern cards — cover up some dots and have the children write the appropriate subtraction story.

For example,  $7 - 2 = 5$ .

Use group discussion to clarify and reinforce this concept and its relationship to addition.

## OBJECTIVE

To write the related sentences for a given set of numbers

## PACING

Level A 1-12  
Level B 1-12  
Level C 1, 8-14

## MATERIALS

2 different coloured blocks — 4 red, 2 blue

## SUGGESTIONS

**Initial Activity** Discuss with the children the total number of blocks and how the colours may suggest certain combinations for putting these blocks together.

4 red + 2 blue = 6 blocks

2 blue + 4 red = 6 blocks

Discuss the possible subtraction combinations.

6 blocks - 2 blue = 4 red

6 blocks - 4 red = 2 blue

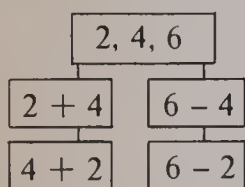
Isolate the different numbers used in the recording above: 6, 4, 2.

Have children suggest other numbers that work together in a "family" and demonstrate as previously.

## ACTIVITIES

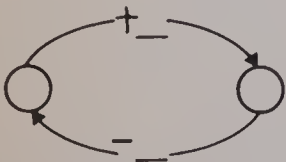
1. Make a mobile to go with a series of related numbers.

*Example*



Instruct the children to make as many as they can.

2. Ditto a sheet filled with this pattern.



Also give the children a set of number combinations such as 7, 5, ■. These combinations are to be completed and entered in the patterns. (Notice some children may write 7, 5, 2 while others may write 7, 5, 12.)

3. Show how to use the Addition Table on page 12 to do subtraction.

Then assign:

(a)  $\begin{array}{r} 12 \\ - 5 \end{array}$  (b)  $\begin{array}{r} 17 \\ - 9 \end{array}$  (c)  $\begin{array}{r} 14 \\ - 8 \end{array}$  (d)  $\begin{array}{r} 16 \\ - 9 \end{array}$  etc.

## 3, 2, and 5



3 speckled eggs

+ 2 white eggs

5 eggs altogether



5 eggs altogether

- 2 eggs are taken away

3 eggs are left

You can make 4 number stories that go with these numbers.

$$3 + 2 = 5$$

$$5 - 2 = 3$$

$$2 + 3 = 5$$

$$5 - 3 = 2$$

Make 4 number stories for each of these.

1. 1, 2, 3

$$1 + 2 = \blacksquare 3$$

$$2 + 1 = \blacksquare 3$$

$$3 - 2 = \blacksquare 1$$

$$3 - 1 = \blacksquare 2$$

2. 2, 8, 10

$$2 + 8 = \blacksquare 10$$

$$8 + 2 = \blacksquare 10$$

$$10 - 8 = \blacksquare 2$$

$$10 - 2 = \blacksquare 8$$

3. 5, 2, 7

4. 4, 3, 7

5. 2, 4, 6

6. 6, 3, 9

7. 5, 1, 4

8. 6, 4, 10

9. 5, 1, 6

10. 5, 9, 4

11. 10, 9, 1

12. 13, 8, 5

★ 13. 17, 8, 9

★ 14. 9, 16, 7

22 Related sentences

**Using the Book** "Notice in the first nest, the eggs are different. How should we describe the two kinds of eggs? (speckled and white)"

"What addition story can you tell about the nest? (2 eggs and 3 eggs is 5 eggs, 3 eggs and 2 eggs is 5 eggs.)"

"Since we are putting together the eggs, we do what? (add)"

"Notice the difference between the picture of the first nest and the picture of the second nest. What has happened? (Two eggs have been taken away.)"

"Tell the story."

"Since we take away, what math word do we use? (subtract)"

"Let's write all the stories with 5, 2, 3."

| Add         | Subtract    |
|-------------|-------------|
| $2 + 3 = 5$ | $5 - 2 = 3$ |
| $3 + 2 = 5$ | $5 - 3 = 2$ |

**Answers:**

- |                |                 |                  |                  |                  |                  |
|----------------|-----------------|------------------|------------------|------------------|------------------|
| 3. $5 + 2 = 7$ | 4. $4 + 3 = 7$  | 5. $2 + 4 = 6$   | 6. $6 + 3 = 9$   | 7. $4 + 1 = 5$   | 8. $6 + 4 = 10$  |
| $2 + 5 = 7$    | $3 + 4 = 7$     | $4 + 2 = 6$      | $3 + 6 = 9$      | $1 + 4 = 5$      | $4 + 6 = 10$     |
| $7 - 2 = 5$    | $7 - 4 = 3$     | $6 - 4 = 2$      | $9 - 3 = 6$      | $5 - 1 = 4$      | $10 - 6 = 4$     |
| $7 - 5 = 2$    | $7 - 3 = 4$     | $6 - 2 = 4$      | $9 - 6 = 3$      | $5 - 4 = 1$      | $10 - 4 = 6$     |
| 9. $5 + 1 = 6$ | 10. $5 + 4 = 9$ | 11. $9 + 1 = 10$ | 12. $8 + 5 = 13$ | 13. $8 + 9 = 17$ | 14. $9 + 7 = 16$ |
| $1 + 5 = 6$    | $4 + 5 = 9$     | $1 + 9 = 10$     | $5 + 8 = 13$     | $9 + 8 = 17$     | $7 + 9 = 16$     |
| $6 - 5 = 1$    | $9 - 4 = 5$     | $10 - 9 = 1$     | $13 - 8 = 5$     | $17 - 9 = 8$     | $16 - 7 = 9$     |
| $6 - 1 = 5$    | $9 - 5 = 4$     | $10 - 1 = 9$     | $13 - 5 = 8$     | $17 - 8 = 9$     | $16 - 9 = 7$     |



# Up and Down Subtraction Stories

Subtraction stories can go up and down.



$$6 - 4 = 2$$

or



Subtract.

|    |   |   |   |   |   |   |
|----|---|---|---|---|---|---|
| 1. | (a) $\begin{array}{r} 7 \\ - 3 \\ \hline 4 \end{array}$ | (b) $\begin{array}{r} 5 \\ - 2 \\ \hline 3 \end{array}$ | (c) $\begin{array}{r} 6 \\ - 3 \\ \hline 3 \end{array}$ | (d) $\begin{array}{r} 4 \\ - 2 \\ \hline 2 \end{array}$ | (e) $\begin{array}{r} 8 \\ - 5 \\ \hline 3 \end{array}$ | (f) $\begin{array}{r} 3 \\ - 2 \\ \hline 1 \end{array}$ |
| 2. | (a) $\begin{array}{r} 9 \\ - 6 \\ \hline 3 \end{array}$ | (b) $\begin{array}{r} 8 \\ - 4 \\ \hline 4 \end{array}$ | (c) $\begin{array}{r} 5 \\ - 3 \\ \hline 2 \end{array}$ | (d) $\begin{array}{r} 7 \\ - 5 \\ \hline 2 \end{array}$ | (e) $\begin{array}{r} 4 \\ - 3 \\ \hline 1 \end{array}$ | (f) $\begin{array}{r} 6 \\ - 2 \\ \hline 4 \end{array}$ |
| 3. | (a) $\begin{array}{r} 8 \\ - 3 \\ \hline 5 \end{array}$ | (b) $\begin{array}{r} 6 \\ - 1 \\ \hline 5 \end{array}$ | (c) $\begin{array}{r} 7 \\ - 4 \\ \hline 3 \end{array}$ | (d) $\begin{array}{r} 9 \\ - 4 \\ \hline 5 \end{array}$ | (e) $\begin{array}{r} 5 \\ - 1 \\ \hline 4 \end{array}$ | (f) $\begin{array}{r} 7 \\ - 7 \\ \hline 0 \end{array}$ |
| 4. | (a) $\begin{array}{r} 7 \\ - 2 \\ \hline 5 \end{array}$ | (b) $\begin{array}{r} 9 \\ - 5 \\ \hline 4 \end{array}$ | (c) $\begin{array}{r} 8 \\ - 2 \\ \hline 6 \end{array}$ | (d) $\begin{array}{r} 2 \\ - 1 \\ \hline 1 \end{array}$ | (e) $\begin{array}{r} 6 \\ - 5 \\ \hline 1 \end{array}$ | (f) $\begin{array}{r} 4 \\ - 1 \\ \hline 3 \end{array}$ |
| 5. | (a) $\begin{array}{r} 3 \\ - 3 \\ \hline 0 \end{array}$ | (b) $\begin{array}{r} 5 \\ - 4 \\ \hline 1 \end{array}$ | (c) $\begin{array}{r} 6 \\ - 6 \\ \hline 0 \end{array}$ | (d) $\begin{array}{r} 8 \\ - 6 \\ \hline 2 \end{array}$ | (e) $\begin{array}{r} 7 \\ - 1 \\ \hline 6 \end{array}$ | (f) $\begin{array}{r} 3 \\ - 1 \\ \hline 2 \end{array}$ |

Vertical subtraction 23

**Using the Book** Say, "Look at the egg on the left. How many spots altogether?"

Write 6 on chalkboard.

"How many spots crossed off?"

Write - 4 in horizontal form to the right of "6".

"How many spots left?" Complete the number story.

Repeat for the other egg but this time write the number story in the vertical format.

Ask, "Does it matter how we write the number story? (no)"

"Tell in your words what this number story is about. (There were 6 spots and 4 were taken away or crossed off to leave only 2.)"

To assign the page say, "Copy each number story in your book and complete the story. Be sure to number each of the stories as they are in the book."

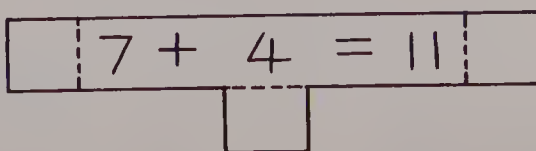
By folding one tab over at a time the children review the basic facts. The child is to write number stories. When the tab is up:

$$7 + \underline{\quad} = 11.$$

When the left tab is over:

$$\underline{\quad} + 4 = 11.$$

3. Make up a set of cards for the facts.



## OBJECTIVE

To subtract in vertical format

## PACING

Level A All

Level B All

Level C 3-5

## MATERIALS

dominoes, poker chips

## RELATED AIDS

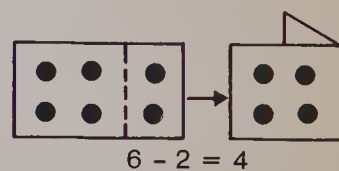
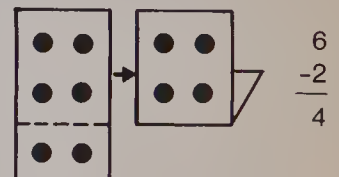
BFA COMP LAB I—47.

## SUGGESTIONS

**Initial Activity** 1. Provide each child with 8 objects such as poker chips. Ask the children to take 6 away. Direct the children to write a number story to tell what has happened. Discuss, emphasizing we have taken away, therefore we subtract.

2. Demonstrate, by folding a domino or a pattern card, that the orientation of the pattern or appropriate number story doesn't affect the answer.

*Example*



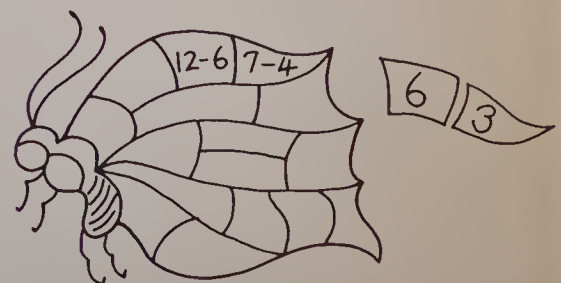
## ACTIVITIES

1. Provide the children with a set of flash cards on the back of which are the answers.

|   |   |   |
|---|---|---|
| $\begin{array}{r} 8 \\ - 3 \\ \hline \end{array}$ | $\begin{array}{r} 9 \\ - 6 \\ \hline \end{array}$ | $\begin{array}{r} 6 \\ - 1 \\ \hline \end{array}$ |
|---|---|---|

Children can work in pairs or the teacher can work with a small group.

2. Make animal drawings as shown with basic subtraction facts. The extra cutouts match each problem area with the correct answer.





OBJECTIVE

To find the difference when a one-digit number is subtracted from a two-digit number (facts to 18)

PACING

- Level A All
- Level B All
- Level C 2-5

MATERIALS

str sticks in ones and bundles of tens, centicubes, elastics

RELATED AIDS

BFA COMP LAB I—47, 49.

SUGGESTIONS

**Initial Activity** 1. Provide the children with 1 ten bundle and 5 one sticks. Ask them to take away 8 sticks. Discuss what they have to do. (They have to undo the bundle of ten and get 15 ones.) Then they can take away 8. Have them write a number story for 15 - 8.

2. Refer the children to page 12. Show them how to use the table to find the answer to 15 - 8. Then ask them to use the table for 16 - 9. Repeat until you feel they can do this successfully.

ACTIVITIES

1. Copy and fill in the missing numbers.

|   |    |    |    |    |
|---|----|----|----|----|
| - | 15 | 16 | 17 | 18 |
| 4 |    |    |    |    |
| 2 |    |    |    |    |
| 1 |    |    |    |    |
| 3 |    |    |    |    |

2. Extend the flash-card set started in Activity 1 on page 23, to include all the basic subtraction facts to 18.

3. Make more cards (see Activity 3, page 23) to include all the facts with 2-digit sums to 18. Have children write subtraction number stories for each.



Falling Leaves

17 leaves.  
- 9 leaves fell down.  
8 leaves left on the tree.

Subtract.

|    |     |                |     |                |     |                 |     |                |     |                |     |                 |
|----|-----|----------------|-----|----------------|-----|-----------------|-----|----------------|-----|----------------|-----|-----------------|
| 1. | ●   | 11<br>- 4<br>7 | (b) | 16<br>- 7<br>9 | (c) | 14<br>- 6<br>8  | (d) | 18<br>- 9<br>9 | (e) | 13<br>- 5<br>8 | (f) | 15<br>- 6<br>9  |
| 2. | ●   | 10<br>- 9<br>1 | (b) | 12<br>- 3<br>9 | (c) | 16<br>- 9<br>7  | (d) | 13<br>- 8<br>5 | (e) | 17<br>- 8<br>9 | (f) | 16<br>- 6<br>10 |
| 3. | (a) | 13<br>- 7<br>6 | (b) | 14<br>- 8<br>6 | (c) | 11<br>- 2<br>9  | (d) | 17<br>- 9<br>8 | (e) | 14<br>- 7<br>7 | (f) | 15<br>- 9<br>6  |
| 4. | (a) | 14<br>- 5<br>9 | (b) | 16<br>- 8<br>8 | (c) | 12<br>- 0<br>12 | (d) | 11<br>- 5<br>6 | (e) | 15<br>- 8<br>7 | (f) | 13<br>- 9<br>4  |
| 5. | (a) | 12<br>- 4<br>8 | (b) | 13<br>- 4<br>9 | (c) | 15<br>- 7<br>8  | (d) | 10<br>- 6<br>4 | (e) | 14<br>- 9<br>5 | (f) | 12<br>- 6<br>6  |

**Using the Book** Refer to the display. Say, "Tell me in your words what the picture tells us." Discuss.

Assign the page. Make certain the children copy the number and question in their books properly and neatly.

# Larger Numbers

You can subtract from larger numbers.



$$\begin{array}{r} 15 \\ - 3 \\ \hline 12 \end{array}$$

| tens | ones |
|------|------|
| 1    | 5    |
|      | 3    |
| 1    | 2    |

You subtract ones.  
 $5 - 3 = 2$

Complete these.

1. (a)  $\begin{array}{r} 18 \\ - 4 \\ \hline 14 \end{array}$  (b)  $\begin{array}{r} 16 \\ - 2 \\ \hline 14 \end{array}$  (c)  $\begin{array}{r} 14 \\ - 3 \\ \hline 11 \end{array}$  (d)  $\begin{array}{r} 13 \\ - 2 \\ \hline 11 \end{array}$  (e)  $\begin{array}{r} 15 \\ - 4 \\ \hline 11 \end{array}$
2.  $\begin{array}{r} 16 \\ - 5 \\ \hline 11 \end{array}$  (b)  $\begin{array}{r} 14 \\ - 1 \\ \hline 13 \end{array}$  (c)  $\begin{array}{r} 13 \\ - 1 \\ \hline 12 \end{array}$  (d)  $\begin{array}{r} 15 \\ - 2 \\ \hline 13 \end{array}$  (e)  $\begin{array}{r} 18 \\ - 5 \\ \hline 13 \end{array}$
3.  $\begin{array}{r} 14 \\ - 2 \\ \hline 12 \end{array}$  (b)  $\begin{array}{r} 18 \\ - 8 \\ \hline 10 \end{array}$  (c)  $\begin{array}{r} 15 \\ - 3 \\ \hline 12 \end{array}$  (d)  $\begin{array}{r} 18 \\ - 7 \\ \hline 11 \end{array}$  (e)  $\begin{array}{r} 16 \\ - 3 \\ \hline 13 \end{array}$
4. (a)  $\begin{array}{r} 34 \\ - 4 \\ \hline 30 \end{array}$  (b)  $\begin{array}{r} 18 \\ - 1 \\ \hline 17 \end{array}$  (c)  $\begin{array}{r} 28 \\ - 3 \\ \hline 25 \end{array}$  (d)  $\begin{array}{r} 86 \\ - 1 \\ \hline 85 \end{array}$  (e)  $\begin{array}{r} 98 \\ - 0 \\ \hline 98 \end{array}$
5. (a)  $\begin{array}{r} 23 \\ - 3 \\ \hline 20 \end{array}$  (b)  $\begin{array}{r} 48 \\ - 6 \\ \hline 42 \end{array}$  (c)  $\begin{array}{r} 56 \\ - 0 \\ \hline 56 \end{array}$  (d)  $\begin{array}{r} 12 \\ - 1 \\ \hline 11 \end{array}$  (e)  $\begin{array}{r} 71 \\ - 1 \\ \hline 70 \end{array}$

Subtraction: 2 digits — 1 digit 25

**Using the Book** Ask a child, "Show 15 in the place-value chart using stir sticks. Now subtract 3. How many are left?"

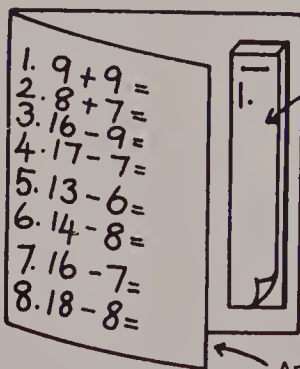
| tens | ones |     |
|------|------|-----|
| 1    | 5    | 15  |
|      | 3    | - 3 |
|      | 2    | 12  |

Assign the page. Tell the children to use the place-value chart and stir sticks if necessary.

## EXTRA PRACTICE

Subtract.

1.  $\begin{array}{r} 18 \\ - 9 \\ \hline \end{array}$  2.  $\begin{array}{r} 17 \\ - 7 \\ \hline \end{array}$
3.  $\begin{array}{r} 16 \\ - 8 \\ \hline \end{array}$  4.  $\begin{array}{r} 15 \\ - 5 \\ \hline \end{array}$
5.  $\begin{array}{r} 17 \\ - 8 \\ \hline \end{array}$  6.  $\begin{array}{r} 16 \\ - 9 \\ \hline \end{array}$
7.  $\begin{array}{r} 15 \\ - 7 \\ \hline \end{array}$  8.  $\begin{array}{r} 17 \\ - 9 \\ \hline \end{array}$
9.  $\begin{array}{r} 15 \\ - 6 \\ \hline \end{array}$  10.  $\begin{array}{r} 14 \\ - 7 \\ \hline \end{array}$



Strips of paper stapled to file folder. Child writes answers here. Tears off strip when completed.

Answers on back.

2. Use the abacus from Activity 2, page 15 to subtract these. Record your answers.

$$\begin{array}{r} 8 \\ - 3 \\ \hline \end{array} \quad \begin{array}{r} 16 \\ - 2 \\ \hline \end{array} \quad \begin{array}{r} 19 \\ - 7 \\ \hline \end{array} \quad \begin{array}{r} 28 \\ - 5 \\ \hline \end{array} \quad \begin{array}{r} 46 \\ - 3 \\ \hline \end{array}$$

3. Use the abacus to subtract.

Record.

$$\begin{array}{r} 35 \\ - 12 \\ \hline \end{array} \quad \begin{array}{r} 44 \\ - 21 \\ \hline \end{array} \quad \begin{array}{r} 56 \\ - 13 \\ \hline \end{array} \quad \begin{array}{r} 68 \\ - 25 \\ \hline \end{array} \quad \begin{array}{r} 54 \\ - 34 \\ \hline \end{array}$$

## OBJECTIVE

To use subtraction facts to 18 with no regrouping

## PACING

Level A All  
Level B All  
Level C 3-5

## MATERIALS

place-value chart and stir sticks for tens and ones

## RELATED AIDS

HMS—DM4.  
BFA COMP LAB I—50.

## SUGGESTIONS

**Initial Activities** 1. Review the place-value chart by asking a child to show 18 using stir sticks.

| tens | ones |    |
|------|------|----|
| 1    | 8    | 18 |

Repeat for other numbers: 23, 30, 43, etc.

2. Use concrete materials to demonstrate the questions on this page.

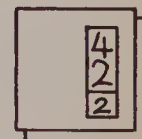
Encourage the children to use their understanding of basic addition facts to 18 to help with these subtraction facts (the inverse relationship).

3. This concept should be demonstrated in a concrete manner using concrete materials. The children record numerically what the different components of the problem mean using a place-value chart.

|     |       |   |
|-----|-------|---|
| 16  | 1 ten | 6 |
| - 4 |       | 4 |

In reviewing the use of a number place-value chart, use a paper with window to isolate the numbers in the one's column and then the ten's column.

$$\begin{array}{r} 14 \\ - 2 \\ \hline \end{array}$$



## ACTIVITIES

1. Make up a drill pad as shown. Children use it when teacher or child feels there is a need.



## OBJECTIVE

To solve problems using subtraction

## PACING

Level A All

Level B All

Level C All

## VOCABULARY

leaves

## MATERIALS

leaves, nuts, cards, marbles

## BACKGROUND

In addition problems the action indicated is taking away, closing, falling, separating, etc. In order for children to know when to subtract in problems they must become aware of the many actions that indicate a need for subtraction.

## SUGGESTIONS

**Initial Activity** Play act with a child. Give Jose 9 cards.

Ask the class, "How many cards does Jose have?"

Take 5 cards from Jose.

Ask, "How many did I take from Jose?"

"What question can I ask now? (How many cards does Jose have now?)"

Say, "Write a number story."

Conclude by writing a sentence: "Jose now has 7 cards."

Repeat for other stories.

## ACTIVITIES

1. Children working in pairs are given a number of leaves or nuts or marbles, etc. The first child makes up a problem and illustrates it with the objects. The second child has to write a number story to solve the problem. Child shows:



Then the child takes 5 away leaving the rest.



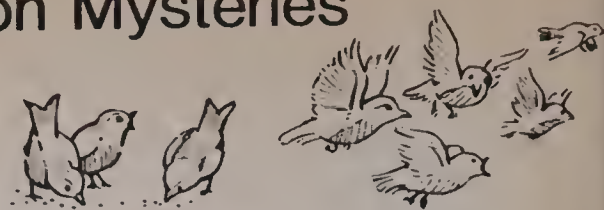
Then children reverse roles.

2. Ask the children to solve Exercises 1, 3, and 5 using different numbers. The numbers should be 18 or less.

3. A puzzle problem like the following is challenging. Chris had 8 marbles.

## Subtraction Mysteries

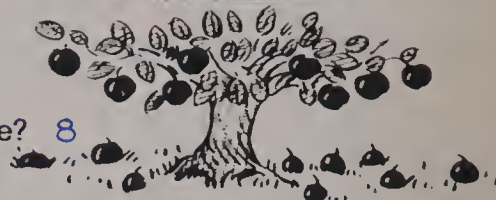
1. 8 birds were on the ground.  
5 birds flew away.  
How many birds are left? 3



2. A nest had 12 eggs.  
7 eggs hatched.  
How many eggs are left? 5



3. 17 apples were on the tree.  
9 apples fell down.  
How many apples are left on the tree? 8



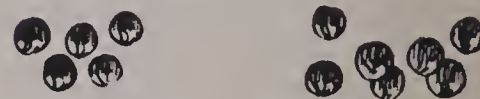
4. 13 leaves were on the tree.  
9 leaves blew away.  
How many leaves are on the tree now? 4



5. John had 10 hockey cards.  
He lost 3 cards.  
How many does he have now? 7



6. Marie had 12 marbles.  
She lost 7 marbles.  
How many does she have now? 5



26 Problem solving

**Using the Book** Direct the children to read the question; then write a number story for the question. Finally they should write a word sentence to answer the question. If necessary, the children should get objects and play act the story.

Emphasize that these problems all involve some objects being taken away, lost, or separated from the other objects. Therefore we subtract.

He lost 6 marbles.  
Then he found 12 marbles.  
Then he lost 4 marbles.  
How many more marbles did he have in the end than at the beginning?  
(Answer: 2.)



# Practice

Add.

- |   |  |  |  |  |  |
|---|--|--|--|--|--|
| 1. (a) $\begin{array}{r} 5 \\ +4 \\ \hline 9 \end{array}$   | (b) $\begin{array}{r} 2 \\ +3 \\ \hline 5 \end{array}$   | (c) $\begin{array}{r} 3 \\ +4 \\ \hline 7 \end{array}$   | (d) $\begin{array}{r} 3 \\ +6 \\ \hline 9 \end{array}$   | (e) $\begin{array}{r} 2 \\ +5 \\ \hline 7 \end{array}$   | (f) $\begin{array}{r} 4 \\ +2 \\ \hline 6 \end{array}$   |
| 2. (a) $\begin{array}{r} 6 \\ +6 \\ \hline 12 \end{array}$  | (b) $\begin{array}{r} 4 \\ +4 \\ \hline 8 \end{array}$   | (c) $\begin{array}{r} 6 \\ +2 \\ \hline 8 \end{array}$   | (d) $\begin{array}{r} 7 \\ +5 \\ \hline 12 \end{array}$  | (e) $\begin{array}{r} 6 \\ +4 \\ \hline 10 \end{array}$  | (f) $\begin{array}{r} 6 \\ +0 \\ \hline 6 \end{array}$   |
| 3. (a) $\begin{array}{r} 7 \\ +8 \\ \hline 15 \end{array}$  | (b) $\begin{array}{r} 8 \\ +9 \\ \hline 17 \end{array}$  | (c) $\begin{array}{r} 9 \\ +5 \\ \hline 14 \end{array}$  | (d) $\begin{array}{r} 4 \\ +9 \\ \hline 13 \end{array}$  | (e) $\begin{array}{r} 9 \\ +9 \\ \hline 18 \end{array}$  | (f) $\begin{array}{r} 7 \\ +9 \\ \hline 16 \end{array}$  |
| 4. (a) $\begin{array}{r} 12 \\ +5 \\ \hline 17 \end{array}$ | (b) $\begin{array}{r} 44 \\ +5 \\ \hline 49 \end{array}$ | (c) $\begin{array}{r} 33 \\ +6 \\ \hline 39 \end{array}$ | (d) $\begin{array}{r} 21 \\ +8 \\ \hline 29 \end{array}$ | (e) $\begin{array}{r} 74 \\ +4 \\ \hline 78 \end{array}$ | (f) $\begin{array}{r} 60 \\ +7 \\ \hline 67 \end{array}$ |

Subtract.

- |   |  |  |  |  |  |
|---|--|--|--|--|--|
| 5. (a) $\begin{array}{r} 6 \\ -2 \\ \hline 4 \end{array}$   | (b) $\begin{array}{r} 8 \\ -3 \\ \hline 5 \end{array}$   | (c) $\begin{array}{r} 9 \\ -5 \\ \hline 4 \end{array}$   | (d) $\begin{array}{r} 3 \\ -2 \\ \hline 1 \end{array}$   | (e) $\begin{array}{r} 7 \\ -3 \\ \hline 4 \end{array}$   | (f) $\begin{array}{r} 9 \\ -2 \\ \hline 7 \end{array}$   |
| 6. (a) $\begin{array}{r} 9 \\ -0 \\ \hline 9 \end{array}$   | (b) $\begin{array}{r} 7 \\ -4 \\ \hline 3 \end{array}$   | (c) $\begin{array}{r} 5 \\ -3 \\ \hline 2 \end{array}$   | (d) $\begin{array}{r} 8 \\ -2 \\ \hline 6 \end{array}$   | (e) $\begin{array}{r} 7 \\ -2 \\ \hline 5 \end{array}$   | (f) $\begin{array}{r} 9 \\ -1 \\ \hline 8 \end{array}$   |
| 7. (a) $\begin{array}{r} 4 \\ -3 \\ \hline 1 \end{array}$   | (b) $\begin{array}{r} 8 \\ -5 \\ \hline 3 \end{array}$   | (c) $\begin{array}{r} 6 \\ -5 \\ \hline 1 \end{array}$   | (d) $\begin{array}{r} 6 \\ -4 \\ \hline 2 \end{array}$   | (e) $\begin{array}{r} 8 \\ -7 \\ \hline 1 \end{array}$   | (f) $\begin{array}{r} 9 \\ -3 \\ \hline 6 \end{array}$   |
| 8. (a) $\begin{array}{r} 12 \\ -1 \\ \hline 11 \end{array}$ | (b) $\begin{array}{r} 15 \\ -2 \\ \hline 13 \end{array}$ | (c) $\begin{array}{r} 18 \\ -4 \\ \hline 14 \end{array}$ | (d) $\begin{array}{r} 16 \\ -3 \\ \hline 13 \end{array}$ | (e) $\begin{array}{r} 18 \\ -3 \\ \hline 15 \end{array}$ | (f) $\begin{array}{r} 17 \\ -7 \\ \hline 10 \end{array}$ |

## OBJECTIVE

To provide practice in addition and subtraction facts to 18

## PACING

Level A First 3 questions in each row

Level B All

Level C First 4 questions in each row

## EXTRA PRACTICE

Complete these.

- |   |   |
|---|---|
| 1. $\begin{array}{r} 4 \\ +3 \\ \hline \end{array}$   | 2. $\begin{array}{r} 7 \\ +4 \\ \hline \end{array}$   |
| 3. $\begin{array}{r} 6 \\ +3 \\ \hline \end{array}$   | 4. $\begin{array}{r} 8 \\ +8 \\ \hline \end{array}$   |
| 5. $\begin{array}{r} 7 \\ +9 \\ \hline \end{array}$   | 6. $\begin{array}{r} 6 \\ +5 \\ \hline \end{array}$   |
| 7. $\begin{array}{r} 7 \\ +7 \\ \hline \end{array}$   | 8. $\begin{array}{r} 4 \\ +9 \\ \hline \end{array}$   |
| 9. $\begin{array}{r} 18 \\ -9 \\ \hline \end{array}$  | 10. $\begin{array}{r} 17 \\ -9 \\ \hline \end{array}$ |
| 11. $\begin{array}{r} 16 \\ -9 \\ \hline \end{array}$ | 12. $\begin{array}{r} 17 \\ -8 \\ \hline \end{array}$ |
| 13. $\begin{array}{r} 16 \\ -8 \\ \hline \end{array}$ | 14. $\begin{array}{r} 15 \\ -8 \\ \hline \end{array}$ |
| 15. $\begin{array}{r} 15 \\ -7 \\ \hline \end{array}$ | 16. $\begin{array}{r} 14 \\ -7 \\ \hline \end{array}$ |

**Using the Book** The children should work independently on these questions. If any children have unusual difficulty with this page, you may want to set up remedial work based on the type of questions found on this page.

It may be desirable to assign this page over two separate days, perhaps a, b, and c of each row one day and d, e, and f of each row the second day—for those who need the extra practice.

## OBJECTIVE

To compare sets by subtraction

## PACING

Level A All  
Level B All  
Level C All

## VOCABULARY

caught, oyster, shrimp

## MATERIALS

shells, pebbles, etc.

## RELATED AIDS

HMS—DM7.

## BACKGROUND

Another aspect of subtraction is indicated by the words "how many more". Here we are comparing two sets by asking "how many more" are in one set than the other.

## SUGGESTIONS

**Initial Activity** Have the children use concrete materials to demonstrate the questions on this page. Match materials for each part of the question to emphasize the comparative aspect of these questions.

*Example*



$$6 - 4 = 2$$

## ACTIVITIES

1. Supply children with subtraction sentences (e.g.,  $8 - 5 = \blacksquare$ , etc.). Have them make up stories with pictures on ditto masters. Use these to make a classroom "Subtraction Book".

2. Prepare several different kinds of "Mini Bingo" cards to look like this:

|    |   |    |
|----|---|----|
| 8  | 6 | 1  |
| 4  | 3 | 12 |
| 14 | 2 | 9  |

Read aloud several "how many more than" situation problems which have answers as on bingo cards. Children  $\times$  out an answer when it's used. Three  $\times$ 's in a row wins.


3. Prepare a series of *relevant* activity cards using actual classroom data such as: "6 people in Julie's family. 4 people in Dave's. How many more in Julie's?" "10 members in  $x$  reading group. 8 members in  $y$ . How many more in  $x$ ?" "32 kids in our

# At the Sea Shore

Kim has 5 shells.

Jane has 3 shells.

How many **more** does Kim have?




$$\begin{array}{r} 5 \\ - 3 \\ \hline 2 \end{array}$$

David caught 4 fish.

Jim caught 2 fish.

How many **more** did David catch?



$$\begin{array}{r} 4 \\ - 2 \\ \hline 2 \end{array}$$

1. A guppy had 6 babies.  
A goldfish had 4 babies.  
How many more did the guppy have?  
 $6 - 4 = \blacksquare 2$
2. Tina collected 7 oysters.  
Jim collected 4 oysters.  
How many more did Tina collect?  
 $7 - 4 = \blacksquare 3$
3. Jane found 15 shrimps.  
Tom found 3 shrimps.  
How many more did Jane find?  
 $15 - 3 = \blacksquare 12$

28 Comparing sets for subtraction (more)

**Using the Book** Direct the children to the first story in the display. Ask the children to tell in their own words what the story is about and what the question asks. Watch to see that the children show they understand the "how many more" aspect.

class. 29 next door. How many more do we have?" "8 classes on first floor. 8 classes on second floor. How many more on first?", etc.

# Conservation Officer

- Jill found 6 owls.  
Mario found 4 owls.  
How many fewer did Mario find? **2**



- Laura saw 9 eagles.  
Linda saw 7 eagles.  
How many fewer did Linda see? **2**



- Irene saw 3 whales.  
Lois saw 2 whales.  
How many fewer did Lois see? **1**



- Fred saw 13 dolphins.  
Tony saw 8 dolphins.  
How many fewer did Tony see? **5**



- Alex spotted 17 cougars.  
Tammy spotted 8 cougars.  
How many fewer did Tammy spot? **9**



- Guy spotted 18 bears.  
Ray spotted 9 bears.  
How many fewer did Ray spot? **9**



Comparing sets for subtraction (fewer) **29**

## OBJECTIVE

To solve problems by comparing sets by subtraction

## PACING

Level A 1-4  
Level B All  
Level C All

## VOCABULARY

eagles, whales, dolphins, cougars, conservation officer

## MATERIALS

pictures of animals (from magazines)

## RELATED AIDS

BFA COMP LAB I—6.

## BACKGROUND

Still another aspect of subtraction is indicated by the words "how many fewer". While this is similar to "how many more", children need practice using this form of comparing two sets.

## SUGGESTIONS

**Initial Activity** Identify the animals illustrated on this page. Discuss why these particular animals may be endangered and what the job of a Conservation Officer may entail. (See notes from Chapter Overview.)

## ACTIVITIES

1. Make a list of other endangered species and compare their numbers. Put them in order from least total number to greatest total number. This could be an ongoing research project throughout the year.

2. Children may draw pictures of animals that need protection and may write a short story telling why the animals need protection.

3. Adapt successful or unused activities from page 28 Activities to illustrate "how many fewer?".

**Using the Book** Have the children use concrete materials or pictures to demonstrate a problem similar to those on this page. Match up materials or pictures from each part of the problem to emphasize the comparison of sets. Establish the idea of "fewer" and write the corresponding subtraction sentence. Do several examples with the children before assigning the page.



OBJECTIVE

To add three addends using the vertical format

PACING

- Level A All
- Level B All
- Level C All

MATERIALS

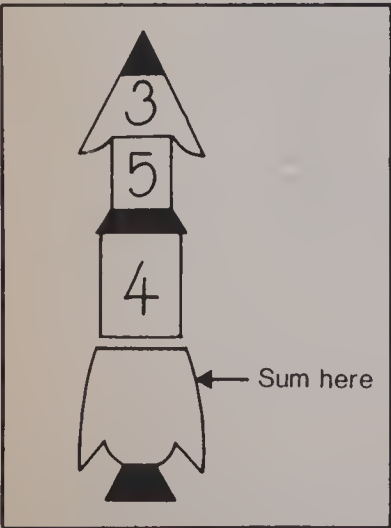
circles of different colours (to represent flavours) with various prices on them

SUGGESTIONS

**Initial Activity** Set up a situation similar to that at the top of page 30. Have the children choose three circles (scoops) and discuss how they might find the price of their cone. Discuss the need to group or “cluster” two numbers before adding.  
Do several examples with the children before assigning the page.

ACTIVITIES

1. Have the children make ice-cream menu cards with various prices and flavours. The children can choose three flavours for each cone, list them with their cost, and add to find the total cost.
2. Prepare a number of “Blast Off” drill cards which can be plasticized so water soluble pens can be used to write the sums on the cards. Restrict the sums to 12. The answer may be written in small print on the reverse side.



3. Prepare a more difficult set of “Blast Off” drill cards with sums to 18.

Adding Three Numbers

Mary wanted a 3-scoop ice-cream cone.  
1 scoop of chocolate for 4 cents.  
1 scoop of vanilla for 3 cents.  
1 scoop of strawberry for 5 cents.  
How much did it cost?  
 $4 + 3 + 5$

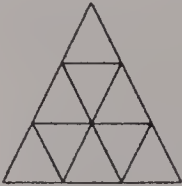


$$\begin{array}{r} 4 \\ 3 \\ +5 \\ \hline 12 \end{array}$$

|   |   |   |  |   |   |
|---|---|---|--|---|---|
| 1. $\begin{array}{r} 2 \\ 2 \\ +4 \\ \hline 8 \end{array}$  | 2. $\begin{array}{r} 2 \\ 2 \\ +6 \\ \hline 10 \end{array}$ | 3. $\begin{array}{r} 4 \\ 1 \\ +1 \\ \hline 6 \end{array}$  | 4. $\begin{array}{r} 4 \\ 2 \\ +3 \\ \hline 9 \end{array}$   | 5. $\begin{array}{r} 4 \\ 5 \\ +2 \\ \hline 11 \end{array}$ | 6. $\begin{array}{r} 4 \\ 4 \\ +4 \\ \hline 12 \end{array}$ |
| 7. $\begin{array}{r} 4 \\ 2 \\ +8 \\ \hline 14 \end{array}$ | 8. $\begin{array}{r} 2 \\ 3 \\ +3 \\ \hline 8 \end{array}$  | 9. $\begin{array}{r} 3 \\ 2 \\ +5 \\ \hline 10 \end{array}$ | 10. $\begin{array}{r} 4 \\ 3 \\ +4 \\ \hline 11 \end{array}$ | 11. $\begin{array}{r} 1 \\ 4 \\ +2 \\ \hline 7 \end{array}$ | 12. $\begin{array}{r} 3 \\ 1 \\ +4 \\ \hline 8 \end{array}$ |

BRAINTICKLER

How many cones (triangles)?



- 1 ■ big triangles
- 3 ■ medium triangles
- 9 ■ little triangles
- 13 ■ triangles

30 Addition with three addends

**Using the Book** Direct the children to copy Exercise 1 in their workbook. They then are to add the first two numbers, and if necessary they may write this sum to the right of these numbers. They then are to add this sum and the last number. This final sum is written in the usual place for the sum. The use of this “crutch” should be encouraged only as long as it’s needed.  
All children should be encouraged to try this Braintickler. Encourage children to use an organized way to count the triangles.

EXTRA PRACTICE

- Add.
- |  |  |
|--|--|
| 1. $\begin{array}{r} 4 \\ 3 \\ +2 \\ \hline \end{array}$ | 2. $\begin{array}{r} 5 \\ 6 \\ +4 \\ \hline \end{array}$ |
| 3. $\begin{array}{r} 7 \\ 2 \\ +3 \\ \hline \end{array}$ | 4. $\begin{array}{r} 6 \\ 6 \\ +5 \\ \hline \end{array}$ |
| 5. $\begin{array}{r} 4 \\ 6 \\ +7 \\ \hline \end{array}$ | 6. $\begin{array}{r} 3 \\ 7 \\ +3 \\ \hline \end{array}$ |
| 7. $\begin{array}{r} 8 \\ 5 \\ +4 \\ \hline \end{array}$ | 8. $\begin{array}{r} 2 \\ 8 \\ +5 \\ \hline \end{array}$ |

# Long Mysteries

1. The witch has 4 black brooms,  
5 red brooms, and 3 purple brooms.  
How many brooms does she have altogether?

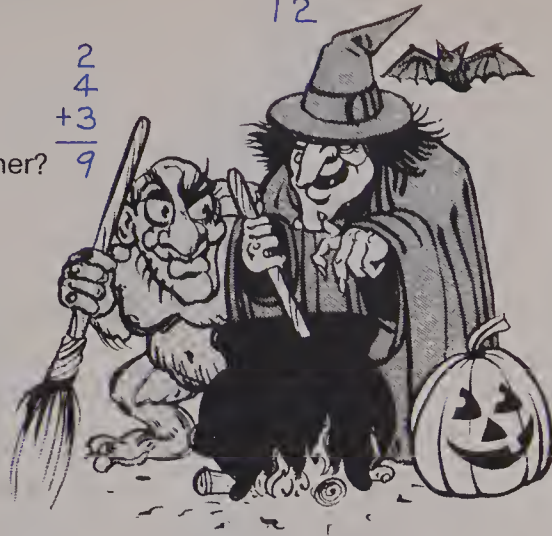
$$\begin{array}{r} 4 \\ 5 \\ +3 \\ \hline 12 \end{array}$$

2. The goblin has 2 black hats,  
4 red hats, and 3 purple hats.  
How many hats does he have altogether?

$$\begin{array}{r} 2 \\ 4 \\ +3 \\ \hline 9 \end{array}$$

3. Mary has 6 pumpkins.  
David has 5 pumpkins.  
Jane has 4 pumpkins.  
How many pumpkins altogether?

$$\begin{array}{r} 6 \\ 5 \\ +4 \\ \hline 15 \end{array}$$



Copy and add.

- |  |   |  |  |   |   |
|--|---|--|--|---|---|
| 4. $\begin{array}{r} 3 \\ 4 \\ +2 \\ \hline 9 \end{array}$   | 5. $\begin{array}{r} 1 \\ 1 \\ +7 \\ \hline 9 \end{array}$  | 6. $\begin{array}{r} 4 \\ 2 \\ +3 \\ \hline 9 \end{array}$   | 7. $\begin{array}{r} 3 \\ 1 \\ +4 \\ \hline 8 \end{array}$   | 8. $\begin{array}{r} 2 \\ 2 \\ +3 \\ \hline 7 \end{array}$  | 9. $\begin{array}{r} 1 \\ 2 \\ +5 \\ \hline 8 \end{array}$  |
| 10. $\begin{array}{r} 3 \\ 2 \\ +6 \\ \hline 11 \end{array}$ | 11. $\begin{array}{r} 3 \\ 1 \\ +5 \\ \hline 9 \end{array}$ | 12. $\begin{array}{r} 5 \\ 2 \\ +4 \\ \hline 11 \end{array}$ | 13. $\begin{array}{r} 4 \\ 6 \\ +2 \\ \hline 12 \end{array}$ | 14. $\begin{array}{r} 3 \\ 3 \\ +3 \\ \hline 9 \end{array}$ | 15. $\begin{array}{r} 2 \\ 3 \\ +4 \\ \hline 9 \end{array}$ |

Problems and practice 31

**Using the Book** Before children put pencil to paper to complete exercises on this page, have Exercises 1-3 read aloud. Show the relationship between the words and general idea of Exercise 1, to the column addition in the top right corner.

Indicate the answer format and complete Exercises 4 and 5 orally before assigning the page.

## OBJECTIVE

To solve problems and give practice in addition of three addends

## PACING

Level A 1-9  
Level B 1-12  
Level C Odd numbered

## MATERIALS

variety of concrete materials as needed

## RELATED AIDS

BFA COMP LAB I-12.

## SUGGESTIONS

**Initial Activity** Set up a situation similar to Exercise 1 on page 31. Solve it together emphasizing the addition of the two addends at the bottom and then the addition of that sum to the addend at the top.

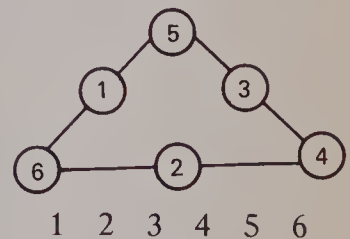
$$\begin{array}{r} 4 \\ 5 \\ +3 \\ \hline 12 \end{array} + 8$$

Do several examples with the children before assigning the page.

## ACTIVITIES

1. Prepare cards such as:

Use the numbers from 1 to 6 only. Put one number in each so the three sides of the triangle each add up to 12.



Answers are given.

2. Use the numbers 2, 3, 4, 5, 6, 7 to fill the circles in Activity 1 to make each side have the sum of (a) 12 (b) 15.

3. Have the children copy these two puzzles and complete by adding.

|   |   |   |  |
|---|---|---|--|
| 2 | 3 | 1 |  |
| 3 | 2 | 1 |  |
| 1 | 2 | 3 |  |
|   |   |   |  |

|   |   |   |  |
|---|---|---|--|
| 4 | 2 | 1 |  |
| 2 | 3 | 1 |  |
| 2 | 1 | 4 |  |
|   |   |   |  |

## OBJECTIVE

To identify the Roman numerals from 1 to 12

## PACING

Level A All  
Level B All  
Level C All

## VOCABULARY

Roman

## MATERIALS

toothpicks

## SUGGESTIONS

**Initial Activity** Use toothpicks to make our numbers — note difficulty in making rounded numbers.

Initially, the Roman numerals I, II, and III can be related as representing 1, 2, and 3; it is important to establish V as representing five and X as representing 10. From this point, it will be easier to discover the relative values for IV (5 - 1), VI (5 + 1), VII (5 + 2), VIII (5 + 3), IX (10 - 1), XI (10 + 1), and XII (10 + 2).

Make Roman numerals using toothpicks.

Match the Roman numerals and the numerals we use now.

## ACTIVITIES

1. Make Roman numerals on "clay tablets". Speculate as to what these numbers could mean if they had been dug up at an archaeological site (house numbers, cards, etc.).

See if the children are able to relate what they have learned about the numerals I to XII and see if they can discover the numbers to twenty.

2. A unit could be introduced on various methods of telling time — shadow clocks, candle clocks.

Relate to Roman numerals on clocks.

3. Introduce the word Arabic for our numerals. Have two teams — the Roman team and the Arabic team. One team member writes a numeral in their way and the other team member has to write the same numeral in their way. They take turns writing the first number. The team with the most correct is the winner.

## Roman Numerals

I II III IV V VI VII VIII IX X XI XII



Roman Numerals are easy to use.

They are like **adding** or **subtracting** numerals.

I = 1

V = 5

X = 10

What is: III?

VI (one after 5)?

IX (one before 10)?

Write **our** numerals for these. Copy and complete.

● X = ■ 10

4. XI = ■ 11

7. V = ■ 5

10. II = ■ 2

● VI = ■ 6

5. VII = ■ 7

8. I = ■ 1

11. VIII = ■ 8

● IX = ■ 9

6. III = ■ 3

9. XII = ■ 12

12. IV = ■ 4

Write number stories for these.

13. III = 1 + 1 + 1

15. XI = ■ 10 + 1

17. IX = ■ 10 - 1

19. VI = ■ 5 + 1

● VII = ■ 5 + 1 + 1

16. VIII = ■ 5 + 1 + 1 + 1

18. IV = ■ 5 - 1

20. XII = ■ 10 + 1 + 1

## BRAINTICKLER

I am more than V + III.  
I am less than XII - II.

Who am I? IX

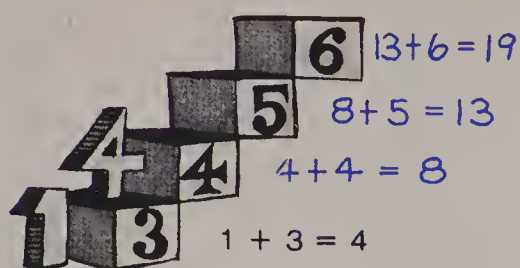
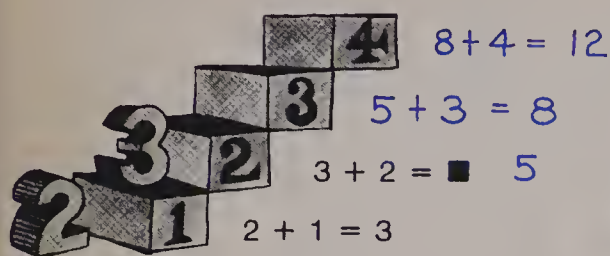
**Using the Book** Discuss the display by having a child read the numerals across the top. Ask how they would explain VII, IV, IX, XI, XII.



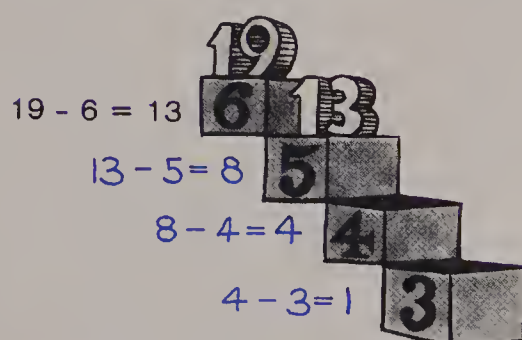
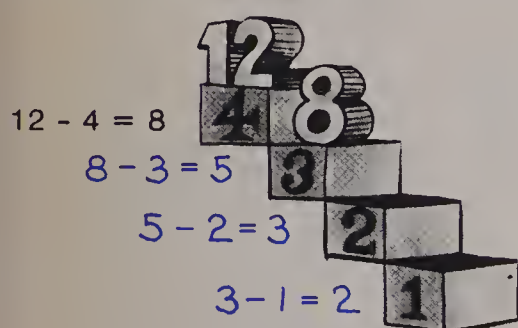
# Addition Stairs

Add the numbers beside each other and put the answer on the next step up. This number will be one of the numbers that you add next.

Copy and complete.



Now use these as subtraction stairs.



Make up some more addition and subtraction stairs of your own.

Addition and subtraction practice 33

## OBJECTIVE

To add and subtract using "stairs"

## PACING

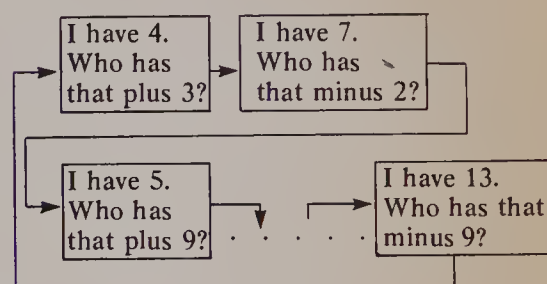
Level A All  
 Level B All  
 Level C Optional

## MATERIALS

transparency of stairs, overhead projector

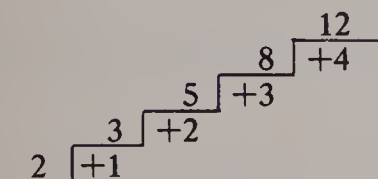
## ACTIVITIES

1. Have the children make up "stairs" for their friends and trade papers. Note: Remind the children to start with large numbers in subtraction.
2. Make up a set of cards for "I Have".

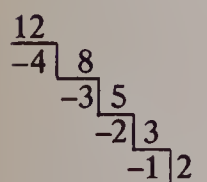


The cards are dealt out one to a player. Someone starts and play continues until it gets back to the one who started.

**Using the Book** Demonstrate how to use the stairs for addition and later for subtraction using the chalkboard, chart, or the overhead and transparency to record.



This can then be used in reverse to emphasize the relationship between addition and subtraction.



OBJECTIVE

To provide practice in addition and subtraction

PACING

- Level A First three questions in each row and 37, 38
- Level B All
- Level C First four questions in each row and 37, 38

EXTRA PRACTICE

Add.

1. 14  
+ 5  
—

2. 16  
+ 3  
—

3. 17  
+ 2  
—

4. 5  
+ 13  
—

5. 22  
+ 6  
—

6. 31  
+ 7  
—

7. 24  
+ 5  
—

8. 6  
+ 41  
—

9. 4  
+ 33  
—

10. 21  
+ 8  
—

Subtract.

1. 9  
- 4  
—

2. 7  
- 5  
—

3. 8  
- 4  
—

4. 7  
- 2  
—

5. 77  
- 4  
—

6. 83  
- 0  
—

7. 56  
- 5  
—

8. 49  
- 7  
—

9. 63  
- 1  
—

10. 38  
- 6  
—

Practice

Add.

1. 4  
+ 6  
—  
10

2. 5  
+ 8  
—  
13

3. 9  
+ 4  
—  
13

4. 10  
+ 3  
—  
13

5. 14  
+ 5  
—  
19

6. 25  
+ 3  
—  
28

7. 3  
+ 14  
—  
17

8. 2  
+ 25  
—  
27

9. 6  
+ 40  
—  
46

10. 2  
+ 36  
—  
38

11. 8  
+ 21  
—  
29

12. 7  
+ 60  
—  
67

13. 62  
+ 4  
—  
66

14. 46  
+ 3  
—  
49

15. 50  
+ 8  
—  
58

16. 26  
+ 2  
—  
28

17. 42  
+ 4  
—  
46

18. 31  
+ 8  
—  
39

Subtract.

19. 9  
- 4  
—  
5

20. 7  
- 2  
—  
5

21. 8  
- 5  
—  
3

22. 14  
- 7  
—  
7

23. 18  
- 8  
—  
10

24. 15  
- 6  
—  
9

25. 12  
- 8  
—  
4

26. 10  
- 6  
—  
4

27. 17  
- 9  
—  
8

28. 12  
- 0  
—  
12

29. 15  
- 8  
—  
7

30. 24  
- 2  
—  
22

31. 74  
- 3  
—  
71

32. 48  
- 3  
—  
45

33. 65  
- 2  
—  
63

34. 27  
- 3  
—  
24

35. 18  
- 4  
—  
14

36. 36  
- 5  
—  
31

Solve.

37. Jane found 24 shells.  
Tom gave her 5 more.  
How many does she  
have now? 29

38. Tom found 14 shells.  
He gave 5 away.  
How many does  
he have left? 9

**Using the Book** The children should work independently on these questions. If unusual difficulties arise with this page, you may want to set up remedial work based on the type of questions on this page.

It may be desirable to assign this page over two separate days—the three columns on the left side the first day and the three columns on the right side the second day—for those who need the practice.

# Chapter Test

## OBJECTIVE

To evaluate achievement of the chapter objectives

## PACING

Level A All  
Level B All  
Level C All

## RELATED AIDS

HMS—DM1 and DM8.

Copy and complete.

Add.

- |  |  |   |   |  |
|--|--|---|---|--|
| 1. $\begin{array}{r} 4 \\ +3 \\ \hline 7 \end{array}$  | 2. $\begin{array}{r} 5 \\ +2 \\ \hline 7 \end{array}$  | 3. $\begin{array}{r} 8 \\ +1 \\ \hline 9 \end{array}$   | 4. $\begin{array}{r} 2 \\ +7 \\ \hline 9 \end{array}$   | 5. $\begin{array}{r} 6 \\ +4 \\ \hline 10 \end{array}$   |
| 6. $\begin{array}{r} 3 \\ +8 \\ \hline 11 \end{array}$ | 7. $\begin{array}{r} 9 \\ +8 \\ \hline 17 \end{array}$ | 8. $\begin{array}{r} 5 \\ +32 \\ \hline 37 \end{array}$ | 9. $\begin{array}{r} 50 \\ +1 \\ \hline 51 \end{array}$ | 10. $\begin{array}{r} 63 \\ +6 \\ \hline 69 \end{array}$ |

Subtract.

- |  |  |  |   |   |
|--|--|--|---|---|
| 11. $\begin{array}{r} 8 \\ -3 \\ \hline 5 \end{array}$   | 12. $\begin{array}{r} 9 \\ -7 \\ \hline 2 \end{array}$   | 13. $\begin{array}{r} 6 \\ -5 \\ \hline 1 \end{array}$   | 14. $\begin{array}{r} 7 \\ -4 \\ \hline 3 \end{array}$  | 15. $\begin{array}{r} 5 \\ -5 \\ \hline 0 \end{array}$  |
| 16. $\begin{array}{r} 16 \\ -2 \\ \hline 14 \end{array}$ | 17. $\begin{array}{r} 18 \\ -4 \\ \hline 14 \end{array}$ | 18. $\begin{array}{r} 17 \\ -7 \\ \hline 10 \end{array}$ | 19. $\begin{array}{r} 18 \\ -9 \\ \hline 9 \end{array}$ | 20. $\begin{array}{r} 14 \\ -8 \\ \hline 6 \end{array}$ |

21. Which number is greater? 26 or <sup>32</sup>32 58 or 52 <sup>58</sup>

22. Complete: 3, 6, 9, <sup>12, 15, 18, 21</sup>■, ■, ■, ■.

23. Is 8 odd or even? <sup>even</sup>

24. Write the numeral for IX. <sup>9</sup>

25. Write the numeral for sixty-eight. <sup>68</sup>

26. Tom made 6 cookies.  
Jane made 13 cookies.

How many cookies altogether? <sup>19</sup>

27. Maggie has 18 rings.  
Jill has 5 rings.

How many more rings  
does Maggie have? <sup>13</sup>

Chapter 1: test 35

**Using the Book** Each child should do this test independently under supervision. Assistance should be given only when the instructions are not understood. After the work has been corrected, you should provide appropriate remedial work. You may wish to reteach if a large number of students had difficulty with a particular topic or concept.

The following chart will help in this regard. The specific objectives are listed in the Chapter Overview.

An alternate Chapter Test can be found in the Holt Mathematics System Duplicating Masters available for use with this grade level.

| Test Item | Objective | Text Page Number |
|-----------|-----------|------------------|
| 1-7       | B         | 12, 13, 15       |
| 8-10      | B         | 17               |
| 11-15     | B         | 23               |
| 16-20     | B         | 25               |
| 21        | A         | 7                |
| 22        | C         | 19               |
| 23        | D         | 20               |
| 24        | E         | 32               |
| 25        | A         | 5                |
| 26, 27    | F         | 14, 16, 26, 29   |



# CHAPTER 2 OVERVIEW

This chapter develops the concepts of place value, addition and subtraction with and without regrouping, and basic notions of measurement.

## OBJECTIVES

- A To measure using the centimetre and metre as standard units of measure
- B To develop the idea of place value to three digits
- C To add two- and three-digit numbers with and without regrouping
- D To subtract one-, two-, and three-digit numbers with and without regrouping
- E To use zero in addition and subtraction
- F To solve word problems
- G To introduce the function machine

## BACKGROUND

All work involving regrouping in addition and subtraction depends on a solid understanding of place value. The children will need many opportunities to “build” numbers using blocks, place-value charts, or similar apparatus, and to physically regroup sets. It may be most useful to use graph paper for recording number facts as this will help the children to keep the numbers in the correct columns.

## MATERIALS

graph paper  
centimetre cubes

Unifix cubes  
variety of concrete materials  
place-value charts  
duplicated place-value charts  
metric rulers in centimetres and metres

## CAREER AWARENESS

### Post Office [49]

Many careers are represented in the services provided by the Post Office — clerks, sorters, handlers, delivery drivers, and letter carriers. All of these jobs would require honesty, an ability to meet the public, and knowledge of prices and geography. There are many ways in which mathematics is an important part of these jobs.

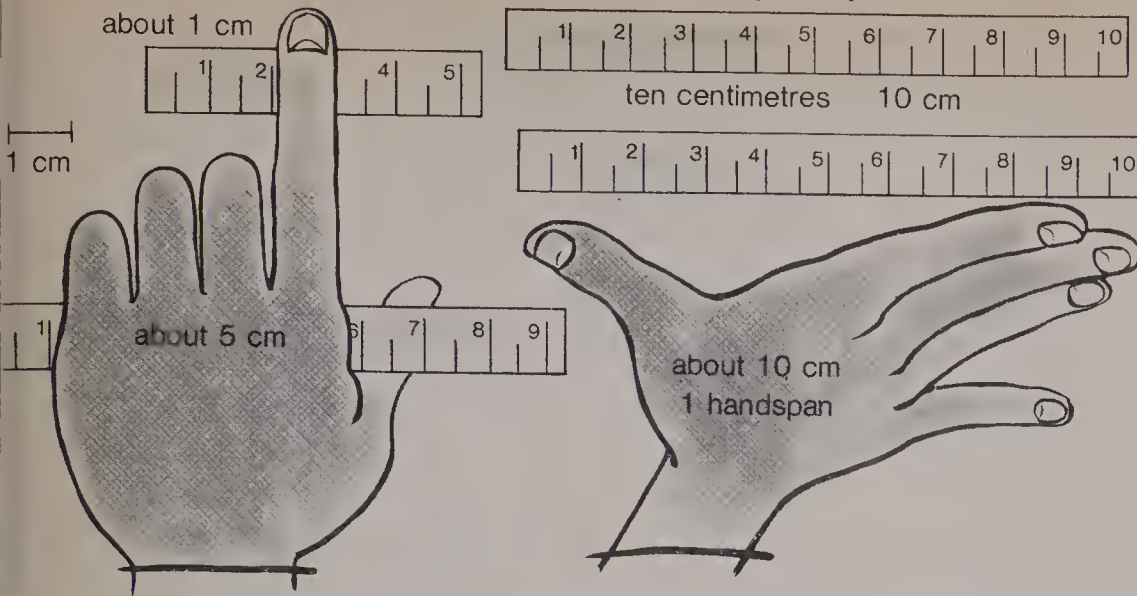
### Bake Shop [64]

A knowledge of prices and awareness of detail would be very important to a clerk in a bake shop. Measurement experiences would have an application as well in this job.

### Flower Shop [77]

Awareness of details and prices would be a necessity for a clerk in this kind of business. Knowledge of temperature control would be important to insure healthy plants in a florist shop. As well, a clerk would need to be honest, tidy, and pleasant in order to meet the public.

# The Centimetre (cm)



## OBJECTIVES

To use the centimetre as a standard unit

To measure items using centimetres

## PACING

Level A All

Level B All

Level C All

## VOCABULARY

handspan

## MATERIALS

10 cm ruler or metre tapes marked in centimetres; nails, cans, screws, keys, and other objects suitable for measuring

## SUGGESTIONS

**Initial Activity** Provide the children with rulers and objects to be measured. Encourage the children to estimate first, then measure to check. Have them record both the estimate and measurement. You may wish to provide a recording sheet similar to this:

| Object    | I think it is ... | It is ... |
|-----------|-------------------|-----------|
| 1. pencil | 20 cm             | 24 cm     |
| 2.        |                   |           |
| 3.        |                   |           |
| 4.        |                   |           |
| 5.        |                   |           |
| 6.        |                   |           |
| 7.        |                   |           |
| 8.        |                   |           |

Repeated experiences of this type will help to make closer estimations and refine this skill.

## ACTIVITIES

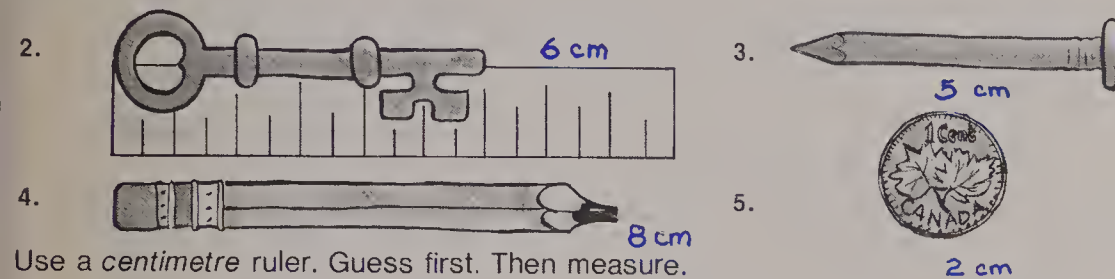
1. Make a chart of "personal referents" to help the children with future experiences in measurement.

|                  | Size |
|------------------|------|
| width of thumb   | cm   |
| length of finger | cm   |
| handspan         | cm   |
| finger to elbow  | cm   |
| :                | :    |

2. Children work in pairs to measure their heights in centimetres and make "Height Strips". These can be used to make a large graph when placed in order. If they are saved, they can be used to compare differences in height later in the year. To measure

1. Measure *your* thumbnail, hand, and handspan.

Number of centimetres?



Use a centimetre ruler. Guess first. Then measure.

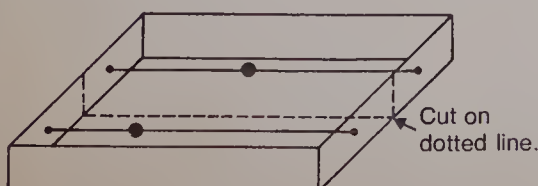
6. chalkboard eraser 7. pencil 8. book 9. shoe 10. chalk

The centimetre 37

**Using the Book** Read or have read the page title. Point out that the "cm" in brackets is a symbol which means "centimetre". Have the children look at the two hands which are being measured in the display. Ask, "What three parts of the hands are being measured? (finger width, hand width, handspan)" Ask, "What is another way of saying 'handspan'? (Accept reasonable responses.)" Discuss the measurements. (finger: 1 cm; hand width: 5 cm; handspan: 10 cm) You may want to ask why 5 cm is correct for width of hand when the ruler actually reads 6 cm. (Hand starts at 1 cm on ruler.) Have children use ruler or metre tape to complete Exercise 1. Remind them to (a) guess first, then measure; (b) when measuring, start at zero on the ruler. Have them complete the exercises. Be sure that they are familiar with where and how they are to record their measurements.

their heights the children can stand against a wall or lie down on the floor. In either case, chalk marks to indicate the foot and head extremes can be used as the ends of segments the children measure.

3. Cut a cardboard box lengthwise and affix two strings with beads to play "Centimetre Race".



The child plays with a partner. Children take turns taking a card from a deck with instructions such as:

Move ahead 4 cm. (Measure to check.)

You slipped! Go back 3 cm. (Measure to check.)

Move ahead 1 cm or take another card.

Cards are returned to bottom of deck. Winner is the first to reach the end of his/her string.



## OBJECTIVE

To add using a centimetre ruler

## PACING

Level A All  
Level B All  
Level C Optional

## VOCABULARY

bouncing

## MATERIALS

1 ruler for each child

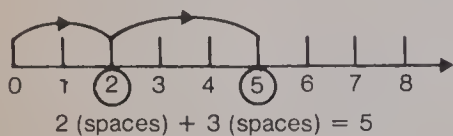
## RELATED AIDS

HMS—DM9.

## BACKGROUND

The ruler is being used in this exercise to introduce the number line in a more concrete and relevant form for children in this age group. Establish the fact that the end of the ruler would be the position of "zero".

Develop the idea that it is the number of spaces that are jumped that is important.



## ACTIVITIES

1. Have the children work in pairs and make up questions for each other.

2. Place a paper strip number line on the floor. A child starting at 0 steps 2 steps (units) then steps 5 units.

Directly above on the chalkboard is a number line on which another child illustrates by drawing a bouncing arrow from 0 to 2 and from 2 to 7. A number sentence is written under the number line:

$$2 + 5 = 7.$$

Repeat with other addends.

3. Provide dittoed sheets of number lines. Children are to draw bouncing arrows to show problems such as:

$$5 + 3 = \underline{\quad} \quad 6 + 9 = \underline{\quad}$$

Children can make up their own problems.

## EXTRA PRACTICE

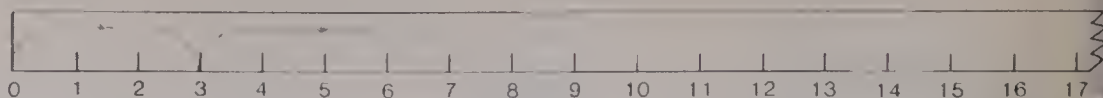
Write the number stories for these.

- |             |              |
|-------------|--------------|
| 1. $6 + 8$  | 2. $5 + 7$   |
| 3. $10 + 4$ | 4. $9 + 6$   |
| 5. $7 + 2$  | 6. $6 + 10$  |
| 7. $11 + 4$ | 8. $12 + 3$  |
| 9. $10 + 7$ | 10. $5 + 11$ |

## Adding on Your Ruler

You can use your ruler to help you add.

Just follow the bouncing arrow.



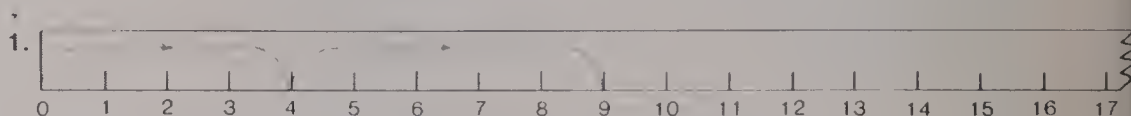
You jump 3 spaces. "3" is the first addend.

You jump 4 more spaces. "4" is the second addend.

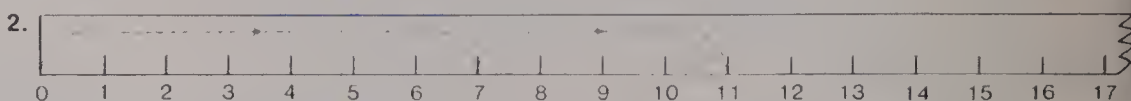
The sum is "7".

$$\begin{array}{r} 3 \\ + 4 \\ \hline 7 \end{array}$$

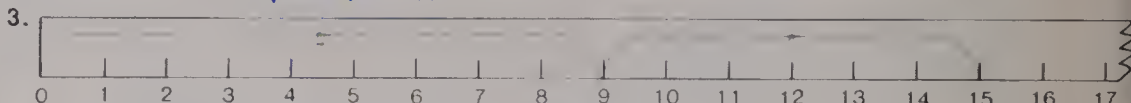
Write the number stories for these.



$$4 + 5 = 9$$



$$7 + 4 = 11$$



$$9 + 6 = 15$$

4.  $4 + 6 = 10$       5.  $8 + 7 = 15$       6.  $2 + 10 = 12$       7.  $5 + 8 = 13$

8.  $11 + 6 = 17$       9.  $3 + 9 = 12$       10.  $1 + 5 = 6$       11.  $13 + 4 = 17$

12.  $9 + 4 = 13$       13.  $7 + 7 = 14$       14.  $5 + 9 = 14$       15.  $2 + 14 = 16$

38 Adding on a centimetre ruler

**Using the Book** Look at the display. Say, "What is the first addend? What is the second addend? What is the sum? Write the number story." Repeat for Exercise 1 and as many others as necessary before assigning the page. Give specific instructions as to how children are to record in their exercise books.



# Adding Big Numbers

Kim has 34 cards.  
Tom has 12 cards.  
How many do *they* have?



$$\begin{array}{r} 34 \\ + 12 \\ \hline \end{array}$$

Add the numbers in the one's place.

| tens | ones |
|------|------|
| 3    | 4    |
| +    | 2    |
|      | 6    |

 $4 + 2 = 6$ 

Add the numbers in the ten's place.

| tens | ones |
|------|------|
| 3    | 4    |
| +    | 2    |
| 4    | 6    |

 $3 + 1 = 4$ 

$$\begin{array}{r} \text{So } 34 \\ + 12 \\ \hline 46 \end{array}$$

Copy and complete.

- |   |   |   |   |  |  |
|---|---|---|---|--|--|
| 1. $\begin{array}{r} 37 \\ + 21 \\ \hline 58 \end{array}$ | 2. $\begin{array}{r} 52 \\ + 34 \\ \hline 86 \end{array}$ | 3. $\begin{array}{r} 73 \\ + 24 \\ \hline 97 \end{array}$ | 4. $\begin{array}{r} 25 \\ + 14 \\ \hline 39 \end{array}$ | 5. $\begin{array}{r} 48 \\ + 41 \\ \hline 89 \end{array}$  | 6. $\begin{array}{r} 64 \\ + 32 \\ \hline 96 \end{array}$  |
| 7. $\begin{array}{r} 36 \\ + 63 \\ \hline 99 \end{array}$ | 8. $\begin{array}{r} 56 \\ + 41 \\ \hline 97 \end{array}$ | 9. $\begin{array}{r} 64 \\ + 23 \\ \hline 87 \end{array}$ | 10. $\begin{array}{r} 75 \\ + 3 \\ \hline 78 \end{array}$ | 11. $\begin{array}{r} 45 \\ + 30 \\ \hline 75 \end{array}$ | 12. $\begin{array}{r} 54 \\ + 42 \\ \hline 96 \end{array}$ |

Addition: two-digit addends 39

**Using the Book** Say, "Read the problem. Are Kim and Tom putting their cards together or separating them? Will we add or subtract? What are the two numbers we will add?" "Let's write the numbers in a place-value chart. How many ones altogether? How many tens altogether? How many cards altogether? Write a sentence." Have the exercises completed. You may want to remind the children that the answers for Exercises 2 and 3 are in the back of the book.

## EXTRA PRACTICE

Copy and complete. (Use graph paper to keep the numbers lined up in the correct columns.)

- |  |   |
|--|---|
| 1. $\begin{array}{r} 22 \\ + 47 \\ \hline \end{array}$ | 2. $\begin{array}{r} 43 \\ + 51 \\ \hline \end{array}$  |
| 3. $\begin{array}{r} 66 \\ + 23 \\ \hline \end{array}$ | 4. $\begin{array}{r} 36 \\ + 52 \\ \hline \end{array}$  |
| 5. $\begin{array}{r} 17 \\ + 81 \\ \hline \end{array}$ | 6. $\begin{array}{r} 63 \\ + 35 \\ \hline \end{array}$  |
| 7. $\begin{array}{r} 83 \\ + 14 \\ \hline \end{array}$ | 8. $\begin{array}{r} 71 \\ + 27 \\ \hline \end{array}$  |
| 9. $\begin{array}{r} 19 \\ + 70 \\ \hline \end{array}$ | 10. $\begin{array}{r} 28 \\ + 41 \\ \hline \end{array}$ |

## OBJECTIVE

To find the sums of 2 two-digit addends without regrouping

## PACING

Level A All  
Level B All  
Level C All

## MATERIALS

coloured transparent sheet with window cut out to show three numbers vertically, overhead projector, place-value charts, and stir sticks

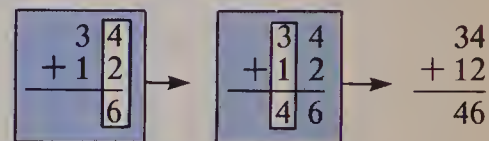
## RELATED AIDS

HMS—DM10 and DM11.  
BFA COMP LAB I—21.

## SUGGESTIONS

**Initial Activity** Use the transparent sheet to isolate numbers in the one's column and then in the ten's column. Record the answers on the overhead projector.

*Example*



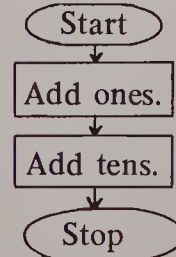
## ACTIVITIES

1. Provide each child with a place-value chart and red stir sticks for tens and blue stir sticks for ones. Have children show 24 on their place-value chart. They write this as the first addend. Then they add 13 (1 red and 3 blue). This is the second addend. Find the sum and check with the place-value chart. Repeat for:

$$\begin{array}{r} 22 \\ + 14 \\ \hline \end{array} \quad \begin{array}{r} 35 \\ + 20 \\ \hline \end{array} \quad \begin{array}{r} 27 \\ + 42 \\ \hline \end{array}$$

2. Let children take turns doing addition on the overhead projector as described in Initial Activity.

3. Give each this flow chart. (This could be made into a mobile and used as a reminder for the children.)



Then have children do addition on cards like these (no regrouping).

$$\begin{array}{r} 43 \\ + 26 \\ \hline \end{array} \quad \begin{array}{r} 20 \\ + 54 \\ \hline \end{array} \quad \begin{array}{r} 36 \\ + 52 \\ \hline \end{array}$$

Answers can be written on the backs of the cards.

## OBJECTIVE

To practise addition of two-digit addends

## PACING

Level A All  
Level B All  
Level C 2, 4, 6

## RELATED AIDS

BFA COMP LAB I—21.

## EXTRA PRACTICE

Copy and complete. (Use graph paper.)

- |   |   |
|---|---|
| 1. $\begin{array}{r} 65 \\ + 23 \\ \hline \end{array}$  | 2. $\begin{array}{r} 52 \\ + 35 \\ \hline \end{array}$  |
| 3. $\begin{array}{r} 63 \\ + 31 \\ \hline \end{array}$  | 4. $\begin{array}{r} 17 \\ + 32 \\ \hline \end{array}$  |
| 5. $\begin{array}{r} 45 \\ + 55 \\ \hline \end{array}$  | 6. $\begin{array}{r} 38 \\ + 51 \\ \hline \end{array}$  |
| 7. $\begin{array}{r} 72 \\ + 27 \\ \hline \end{array}$  | 8. $\begin{array}{r} 18 \\ + 11 \\ \hline \end{array}$  |
| 9. $\begin{array}{r} 84 \\ + 15 \\ \hline \end{array}$  | 10. $\begin{array}{r} 35 \\ + 34 \\ \hline \end{array}$ |
| 11. $\begin{array}{r} 26 \\ + 55 \\ \hline \end{array}$ | 12. $\begin{array}{r} 44 \\ + 33 \\ \hline \end{array}$ |
| 13. $\begin{array}{r} 15 \\ + 42 \\ \hline \end{array}$ | 14. $\begin{array}{r} 28 \\ + 71 \\ \hline \end{array}$ |

## Practice

Copy and complete.

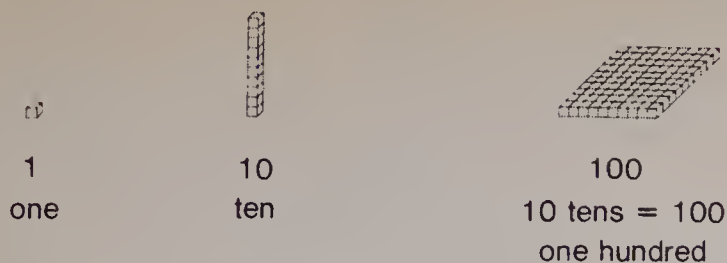
- |   |  |  |  |  |  |
|---|--|--|--|--|--|
| 1. (a) $\begin{array}{r} 32 \\ + 56 \\ \hline 88 \end{array}$ | (b) $\begin{array}{r} 54 \\ + 14 \\ \hline 68 \end{array}$ | (c) $\begin{array}{r} 35 \\ + 24 \\ \hline 59 \end{array}$ | (d) $\begin{array}{r} 22 \\ + 51 \\ \hline 73 \end{array}$ | (e) $\begin{array}{r} 14 \\ + 51 \\ \hline 65 \end{array}$ | (f) $\begin{array}{r} 65 \\ + 11 \\ \hline 76 \end{array}$ |
| 2. (a) $\begin{array}{r} 82 \\ + 13 \\ \hline 95 \end{array}$ | (b) $\begin{array}{r} 71 \\ + 14 \\ \hline 85 \end{array}$ | (c) $\begin{array}{r} 53 \\ + 25 \\ \hline 78 \end{array}$ | (d) $\begin{array}{r} 33 \\ + 40 \\ \hline 73 \end{array}$ | (e) $\begin{array}{r} 62 \\ + 24 \\ \hline 86 \end{array}$ | (f) $\begin{array}{r} 23 \\ + 44 \\ \hline 67 \end{array}$ |
| 3. (a) $\begin{array}{r} 12 \\ + 74 \\ \hline 86 \end{array}$ | (b) $\begin{array}{r} 23 \\ + 64 \\ \hline 87 \end{array}$ | (c) $\begin{array}{r} 51 \\ + 23 \\ \hline 74 \end{array}$ | (d) $\begin{array}{r} 15 \\ + 43 \\ \hline 58 \end{array}$ | (e) $\begin{array}{r} 73 \\ + 6 \\ \hline 79 \end{array}$  | (f) $\begin{array}{r} 64 \\ + 13 \\ \hline 77 \end{array}$ |
| 4. (a) $\begin{array}{r} 14 \\ + 42 \\ \hline 56 \end{array}$ | (b) $\begin{array}{r} 50 \\ + 21 \\ \hline 71 \end{array}$ | (c) $\begin{array}{r} 32 \\ + 25 \\ \hline 57 \end{array}$ | (d) $\begin{array}{r} 26 \\ + 31 \\ \hline 57 \end{array}$ | (e) $\begin{array}{r} 13 \\ + 32 \\ \hline 45 \end{array}$ | (f) $\begin{array}{r} 34 \\ + 12 \\ \hline 46 \end{array}$ |
| 5. (a) $\begin{array}{r} 36 \\ + 22 \\ \hline 58 \end{array}$ | (b) $\begin{array}{r} 23 \\ + 34 \\ \hline 57 \end{array}$ | (c) $\begin{array}{r} 47 \\ + 52 \\ \hline 99 \end{array}$ | (d) $\begin{array}{r} 50 \\ + 36 \\ \hline 86 \end{array}$ | (e) $\begin{array}{r} 43 \\ + 52 \\ \hline 95 \end{array}$ | (f) $\begin{array}{r} 16 \\ + 12 \\ \hline 28 \end{array}$ |
| 6. (a) $\begin{array}{r} 14 \\ + 32 \\ \hline 46 \end{array}$ | (b) $\begin{array}{r} 35 \\ + 60 \\ \hline 95 \end{array}$ | (c) $\begin{array}{r} 24 \\ + 32 \\ \hline 56 \end{array}$ | (d) $\begin{array}{r} 42 \\ + 3 \\ \hline 45 \end{array}$  | (e) $\begin{array}{r} 73 \\ + 16 \\ \hline 89 \end{array}$ | (f) $\begin{array}{r} 20 \\ + 70 \\ \hline 90 \end{array}$ |
| 7. (a) $\begin{array}{r} 40 \\ + 40 \\ \hline 80 \end{array}$ | (b) $\begin{array}{r} 34 \\ + 25 \\ \hline 59 \end{array}$ | (c) $\begin{array}{r} 3 \\ + 63 \\ \hline 66 \end{array}$  | (d) $\begin{array}{r} 60 \\ + 30 \\ \hline 90 \end{array}$ | (e) $\begin{array}{r} 26 \\ + 42 \\ \hline 68 \end{array}$ | (f) $\begin{array}{r} 34 \\ + 63 \\ \hline 97 \end{array}$ |

40 Addition: two-digit addends

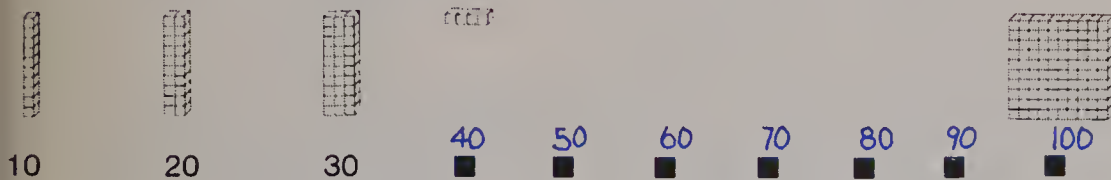
**Using the Book** It may be desirable to assign this page over two days — questions a, b, c in each row one day and d, e, f in each row the second day — for those who need the practice.

The children should work independently on these questions. If any children have unusual difficulty with this page, you may want to set up remedial work based on the type of facts found on this page.

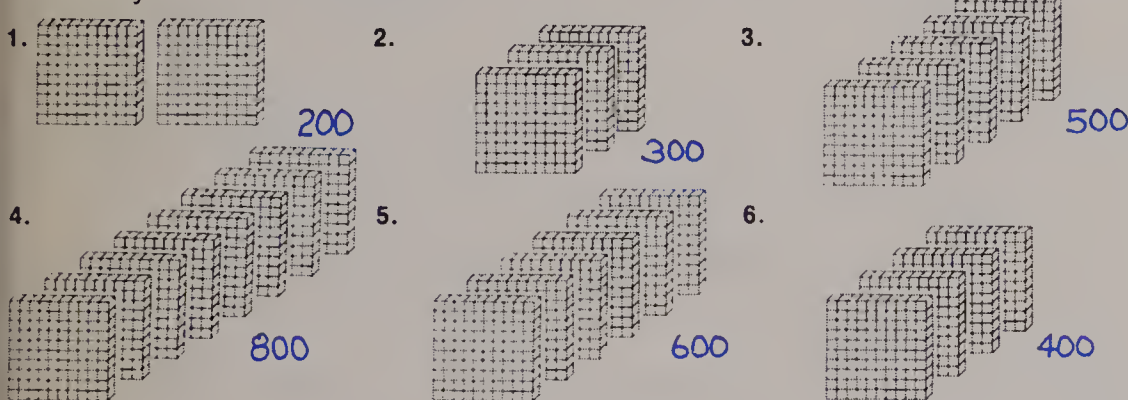
# Tens and Hundreds



Make these stacks. Keep counting.



How many?



Hundreds 41

**Using the Book** Have the children look at the cube and stacked cubes at the top of the display. Point out to them the relationship between these three, that is, that ten is simply 10 ones, and that one hundred is ten stacks of ten. Use the chalkboard or paper (preferably graphed) to pictorially complete the missing stacks from the lower portion of the display (i.e., 40-90).

Exercises 1-6 are ideal as an oral follow-up to the display demonstration. You may however, wish to demonstrate how this exercise could be noted in a workbook or sheet thereby consolidating a review of hundreds, hundred's notation and work habits, work organization.

3. Make a matching game using cards labelled like this:

|     |                          |
|-----|--------------------------|
| 325 | 3 hundreds 2 tens 5 ones |
| 406 | 4 hundreds 0 tens 6 ones |
| 105 | 1 hundred 0 tens 5 ones  |
| 150 | 1 hundred 5 tens 0 ones  |

etc.

## OBJECTIVE

To review the meaning of place value for three-digit numbers

## PACING

Level A All  
Level B All  
Level C Optional

## MATERIALS

variety of materials suited to grouping into sets of tens and hundreds, for example, Unifix cubes, centimetre cubes, sticks, bread ties, toothpicks, etc.; box lids, elastics, cardboard models of ones, tens, hundreds

## RELATED AIDS

HMS—DM12.

## BACKGROUND

There are three ways used early in this series to write numbers:

standard numeral 356

expanded word form 3 hundreds

5 tens 6 ones

expanded number form  $300 + 50 + 6$

## SUGGESTIONS

**Initial Activity** Have the children count out a set of ten cubes and stack them. Continue until ten sets of ten have been counted. Put this set of ten tens (or one hundred) into a box lid and label it.

Have the children choose some "hundreds" (box lids), some "tens", and some loose "ones". Record numerically the value of the objects chosen.

Emphasize the meaning of the relative position of the numbers in a three-digit number.

*Example 246*

"The 2 means 2 hundreds.

The 4 means 4 tens.

The 6 means 6 ones."

## ACTIVITIES

1. Give each pair of children a set of cardboard ones, tens (longs), and hundreds (flats). (See DM2.) Children take turns calling a number (3 digits), and the partner makes up the number using the flats, longs, and ones.

2. Use the "Numbers Game" in the Activity Reservoir but this time each child writes the number he draws in expanded form.



## OBJECTIVE

To reinforce the meaning of place value for three-digit numbers

## PACING

Level A All  
Level B All  
Level C All

## VOCABULARY

digits, numeral

## RELATED AIDS

HMS—DM13.

## SUGGESTIONS

**Initial Activity** Display 3 headings which say "One Digit", "Two Digit", and "Three Digit". Under each, write several examples of such numbers (i.e., under "Two Digit" write 31, 63, 59, etc.). When children have had several minutes to study the demonstration, challenge them to explain in their words, what one-, two-, and three-digit numbers are and what the word "digit" means.

## ACTIVITIES

1. Prepare 3 envelopes with headings as in Initial Activity. Prepare various 1-, 2-, and 3-digit numeral cards. Have children sort cards into the appropriate envelope. When one child has sorted the cards, have another child check for accuracy.

2. Prepare a matching game such as:

|     |   |            |        |        |
|-----|---|------------|--------|--------|
| 315 | ↗ | 6 hundreds | 1 ten  | 9 ones |
| 431 | ↘ | 5 hundreds | 0 tens | 5 ones |
| 619 | ↗ | 3 hundreds | 1 ten  | 5 ones |
| 205 | ↘ | 2 hundreds | 0 tens | 5 ones |

etc.

3. Prepare cards continuing the exercises as in Exercises 11, 12, and 13.

Have the children respond simply by placing a narrow sheet of paper beside the card and writing the expanded number.

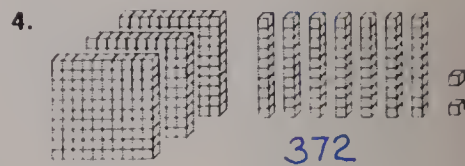
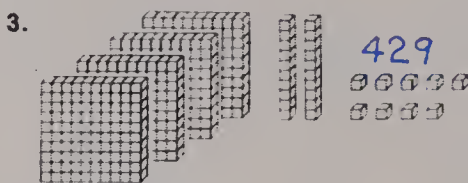
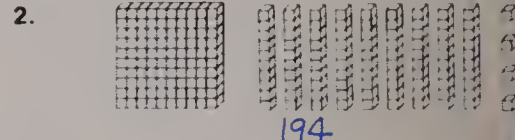
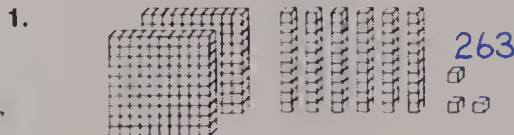
1. What does the 6 mean in:  
216?  
602?  
369?

1.  
6 ones  
6 hundreds  
etc.  
Name \_\_\_\_\_

## Three Digits



How many?



Write the numeral.

5. 6 hundreds 4 tens 2 ones 642

6. 4 hundreds 3 tens 1 one 431

7. 2 hundreds 4 tens 7 ones 247

8. 5 hundreds 6 tens 2 ones 562

9. 3 hundreds 1 ten 0 ones 310

10. 7 hundreds 0 tens 6 ones 706

What does the 3 mean in:

1. 123? 3 ones

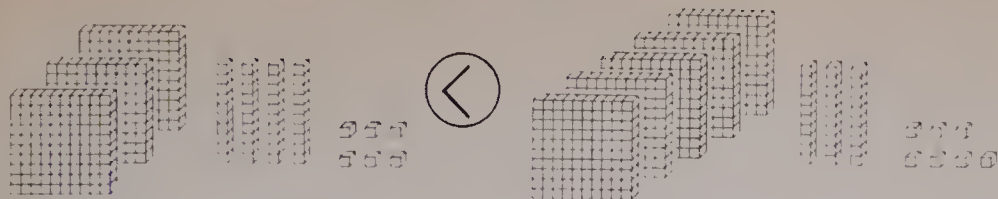
12. 346? 3 hundreds

13. 237? 3 tens

42 Place value. 3 digits

**Using the Book** Discuss the display with the children, emphasizing that "digit" is another name for a numeral and that 346 is a three-digit number. Remind them what each of the digits in 346 stands for. Have all of the instructions read for the page. Be sure children are aware (a) that there are three different tasks on this page (b) of how responses are to be noted.

# Comparing Numbers



346 has fewer hundreds than 537.

346 is less than 537.

$346 < 537$

346 ● 332

346 and 332 both have 3 hundreds.

$46 > 32$

$346 > 332$

346 ● 348

Both have 3 hundreds and 4 tens.

$6 < 8$

$346 < 348$

Check hundreds first. Then tens. Then ones.

Which number has more hundreds?

1. 173 or 754 **754**

2. 947 or 884 **947**

3. 891 or 499 **891**

Which number has more tens?

4. 346 or 332 **346**

5. 427 or 435 **435**

6. 129 or 113 **129**

Which has more ones?

7. 385 or 389 **389**

8. 653 or 651 **653**

9. 121 or 126 **126**

Copy and write < or > in place of the ●

10. 221 ● 122 **>**

11. 386 ● 929 **<**

12. 536 ● 839 **<**

13. 127 ● 283 **<**

14. 641 ● 652 **<**

15. 521 ● 522 **<**

16. 135 ● 98 **>**

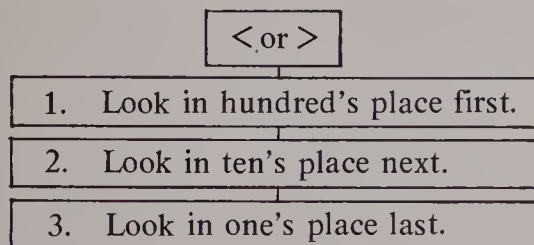
17. 27 ● 227 **<**

18. 359 ● 399 **<**

Comparing 3-digit numbers 43

**Using the Book** Discuss the display by asking, "Why is 346 less than 537? (less hundreds)" "Read about 346 and 332. Why is 346 greater than 332? (same number of hundreds but more tens)" "Read about 346 and 348. Why is 346 less than 348? (same number of hundreds and tens but less ones)"

Remind children to compare the numbers in the hundred's place first. If these are the same, look in the ten's place next. If necessary, the last place to check is in the one's place. Make a mobile:



Emphasize in Exercises 4-6, which has more tens *in the ten's place* and in Exercises 7-9, which has more ones *in the one's place*?

## OBJECTIVE

To compare the value of three-digit numbers

## PACING

Level A All

Level B All

Level C 1, 4, 7, 10-18

## VOCABULARY

comparing

## MATERIALS

overhead projector, chart paper

## RELATED AIDS

HMS—DM13.

## SUGGESTIONS

**Initial Activity** Review the symbols < and >.

Using the overhead projector or chart paper, put sample numbers in line for ease in comparison.

*Example*

| hundreds | tens | ones |
|----------|------|------|
| 3        | 4    | 2    |
| 3        | 3    | 1    |

## ACTIVITIES

- Make a large place-value chart with 2 sets of pockets. Mount this chart on wall in math corner. Colour stir sticks: yellow — for hundreds  
red — for tens  
blue — for ones.

| hundreds | tens | ones |
|----------|------|------|
|          |      |      |
| hundreds | tens | ones |

Children can do the Extra Practice exercises using this chart.

- Use the "Numbers Game" from the Activity Reservoir.

- Select from an old book a set of pages such as 235, 253, 325, 352, 523, 532. These are shuffled, and the child is to place the pages in the correct order.

## EXTRA PRACTICE

Use < or >.

- |              |               |
|--------------|---------------|
| 1. 322 ● 222 | 2. 647 ● 769  |
| 3. 281 ● 171 | 4. 356 ● 334  |
| 5. 761 ● 781 | 6. 547 ● 567  |
| 7. 139 ● 136 | 8. 727 ● 721  |
| 9. 865 ● 869 | 10. 928 ● 929 |



## OBJECTIVE

To add three-digit numbers with no regrouping

## PACING

Level A All  
Level B All  
Level C 1, 3, 5

## MATERIALS

cardboard cutouts of ones, tens, hundreds (see DM2), place-value charts or graph paper for recording

## RELATED AIDS

HMS—DM14.  
BFA COMP LAB I—23, 24.

## SUGGESTIONS

**Initial Activity** Have the children “build” three-digit numbers using the cardboard cutouts for 100’s, 10’s, and 1’s. Then present addition problems that they can work out using the cardboard pieces.

To illustrate addition, move the two groups together and record the total number of ones, tens, and hundreds. Ensure that no regrouping will be involved.

## ACTIVITIES

1. Children may use a mini-calculator to check their answers on page 44.

2. Use blank place-value charts filled in to reinforce adding three-digit numbers (DM14).

3. Make a set of Relay cards like these: (no regrouping)

$$\begin{array}{r} 2 \\ 34 \\ \hline 9 \end{array}$$

$$\begin{array}{r} 32 \\ 77 \\ \hline \end{array}$$

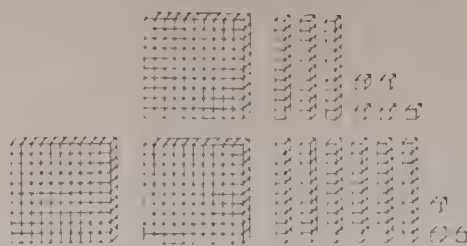
$$\begin{array}{r} 35 \\ 32 \\ \hline 87 \end{array}$$

Two teams line up. The cards are stacked face down on a desk. The first in each team takes a pre-stated route to the stack, picks up a card, goes to the chalkboard and does the question. The child returns the same route and the next child goes. First team finished wins.

**Variation:** Children must walk backwards, or some other way, such as heel to toe, hopping on one foot, etc.

## Adding Hundreds

Add  $135 + 263$ .



| hundreds | tens | ones |      |
|----------|------|------|------|
| 1        | 3    | 5    | 135  |
| 2        | 6    | 3    | +263 |
| 3        | 9    | 8    | 398  |

Add these.

|   |  |  |  |  |
|---|--|--|--|--|
| 1. (a) $\begin{array}{r} 361 \\ +433 \\ \hline 794 \end{array}$ | (b) $\begin{array}{r} 248 \\ +351 \\ \hline 599 \end{array}$ | (c) $\begin{array}{r} 625 \\ +234 \\ \hline 859 \end{array}$ | (d) $\begin{array}{r} 786 \\ +113 \\ \hline 899 \end{array}$ | (e) $\begin{array}{r} 384 \\ +213 \\ \hline 597 \end{array}$ |
| 2. (a) $\begin{array}{r} 412 \\ +367 \\ \hline 779 \end{array}$ | (b) $\begin{array}{r} 541 \\ +236 \\ \hline 777 \end{array}$ | (c) $\begin{array}{r} 862 \\ +126 \\ \hline 988 \end{array}$ | (d) $\begin{array}{r} 845 \\ +134 \\ \hline 979 \end{array}$ | (e) $\begin{array}{r} 155 \\ +434 \\ \hline 589 \end{array}$ |
| 3. (a) $\begin{array}{r} 326 \\ +453 \\ \hline 779 \end{array}$ | (b) $\begin{array}{r} 586 \\ +13 \\ \hline 599 \end{array}$  | (c) $\begin{array}{r} 415 \\ +72 \\ \hline 487 \end{array}$  | (d) $\begin{array}{r} 561 \\ +30 \\ \hline 591 \end{array}$  | (e) $\begin{array}{r} 570 \\ +128 \\ \hline 698 \end{array}$ |
| 4. (a) $\begin{array}{r} 607 \\ +341 \\ \hline 948 \end{array}$ | (b) $\begin{array}{r} 708 \\ +101 \\ \hline 809 \end{array}$ | (c) $\begin{array}{r} 606 \\ +140 \\ \hline 746 \end{array}$ | (d) $\begin{array}{r} 432 \\ +6 \\ \hline 438 \end{array}$   | (e) $\begin{array}{r} 890 \\ +109 \\ \hline 999 \end{array}$ |
| 5. (a) $\begin{array}{r} 381 \\ +204 \\ \hline 585 \end{array}$ | (b) $\begin{array}{r} 695 \\ +304 \\ \hline 999 \end{array}$ | (c) $\begin{array}{r} 86 \\ +113 \\ \hline 199 \end{array}$  | (d) $\begin{array}{r} 403 \\ +591 \\ \hline 994 \end{array}$ | (e) $\begin{array}{r} 8 \\ +381 \\ \hline 389 \end{array}$   |

44 Adding hundreds, no regrouping

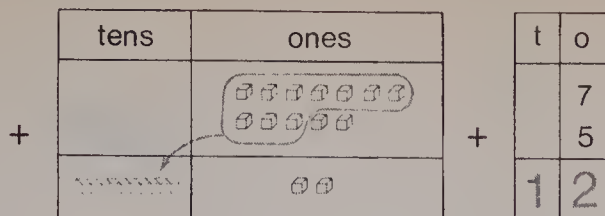
**Using the Book** Refer to the display. Discuss the place-value chart and why each digit is where it is. “Why is the 1 in the hundred’s place?” “Why is the 5 in the one’s place?” etc. Then, “How many ones altogether? tens? hundreds?” Use the place-value chart to do several additions as shown in the display. Large graph paper is very useful in establishing columns used in a place-value chart.



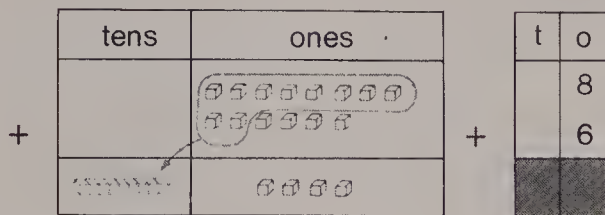
# Trading

Complete.

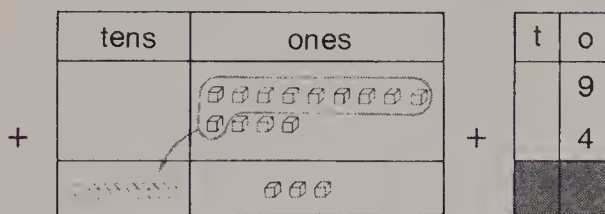
- Jack had 7 ones.  
He added 5 ones.  
He had <sup>1</sup> ten and <sup>2</sup> ones.  
He had  $\blacksquare$  . 12



2. Pat had 8 ones.  
She added 6 ones.  
She had <sup>1</sup> ten and <sup>4</sup> ones.  
She had  $\blacksquare$  . 14



3. Cheryl had 9 ones.  
She added 4 ones.  
She had <sup>1</sup> ten and <sup>3</sup> ones.  
She had  $\blacksquare$  . 13



Add.

- |           |           |           |           |           |
|-----------|-----------|-----------|-----------|-----------|
| ● 7       | 5. 6      | 6. 7      | 7. 8      | 8. 3      |
| +9        | +8        | +7        | +5        | +9        |
| <u>16</u> | <u>14</u> | <u>14</u> | <u>13</u> | <u>12</u> |
| 9. 6      | 10. 9     | 11. 8     | 12. 6     | 13. 7     |
| +7        | +8        | +7        | +5        | +5        |
| <u>13</u> | <u>17</u> | <u>15</u> | <u>11</u> | <u>12</u> |

Regrouping 45

**Using the Book** Provide blank place-value charts with concrete materials. The children can use these to add and record their own results. Do Exercises 1-3 orally. Have the children explain what they are doing.

## OBJECTIVE

To add one-digit numbers involving regrouping

## PACING

Level A All  
Level B All  
Level C 1-4

## MATERIALS

variety of concrete materials (cards, stamps, counters, and so on), place-value charts

## RELATED AIDS

BFA COMP LAB I-11.

## BACKGROUND

Children enjoy trading activities. Whenever possible capitalize on those experiences which are relevant and enjoyable to children and relate them to the learning experience.

## SUGGESTIONS

**Initial Activity** Use the cardboard cutouts of ones, and place-value charts.

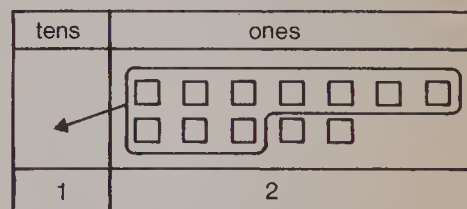
Combine 7 ones and 5 ones. Trade 10 ones for 1 ten (long).

Record: 1 ten and 2 ones

Answer: 12

Use a place-value chart to show the process involved in regrouping.

*Example*



— Circle a set of ten.

— Move it to the ten's place.

## ACTIVITIES

1. To reinforce the concept of regrouping, set up a "Trading Post". Strips of 1¢ stamps (10) could be glued on Bristol board. Several "loose" stamps should be provided.

The children take turns rolling a die twice and "buy" that many loose 1¢ stamps. Whenever they have ten or more, they may trade ten loose stamps in for a ten strip.

2. Provide each pair of children with a place-value chart as shown on page 45. Following the procedures illustrated on the page, children check their answers to Exercises 5-13.

## OBJECTIVES

To use an "extra ten" in regrouping  
To add two-digit numbers with regrouping, using place-value charts

## PACING

Level A All  
Level B All  
Level C All

## VOCABULARY

place-value chart

## MATERIALS

coloured transparent sheet with window cut out to show 4 numbers vertically, sticks, elastic, stamps (from page 45), place-value charts

## RELATED AIDS

HMS—DM15.

## SUGGESTIONS

**Initial Activity** Briefly review the meaning of place value and numbers greater than 9.

Briefly review the addition of three addends.

Have the children do several like this:

$$\begin{array}{r} 1 \\ 4 \\ + 3 \\ \hline \end{array} \quad \begin{array}{r} 1 \\ 2 \\ + 6 \\ \hline \end{array} \quad \begin{array}{r} 1 \\ 3 \\ + 4 \\ \hline \end{array}$$

## ACTIVITIES

1. Use place-value charts with counters (stick sticks) to add 2 two-digit numbers like these:

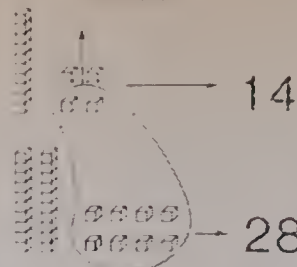
$$\begin{array}{r} 23 \\ + 18 \\ \hline \end{array} \quad \begin{array}{r} 45 \\ + 37 \\ \hline \end{array} \quad \begin{array}{r} 30 \\ + 27 \\ \hline \end{array}$$

2. Make a set of cards with questions involving regrouping. Have sticks and elastics, or stamps, on hand for children to work with in conjunction with the cards until the children feel comfortable with regrouping.

Have the children work in pairs. One does the question numerically and one does it using concrete materials. Check answers and then reverse roles.

3. Provide blank place-value charts and have the children make up questions for each other (DM10). Children can use mini-calculators to check their work.

## An "Extra Ten"

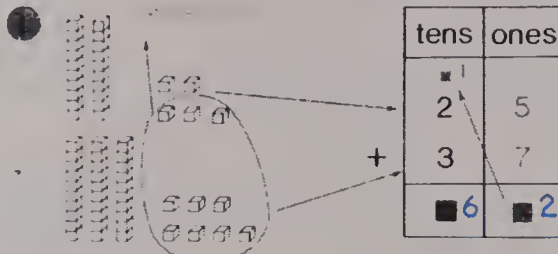


| tens | ones |
|------|------|
| 1    | 4    |
| 2    | 8    |

| tens | ones |
|------|------|
| 1    | 4    |
| 2    | 8    |
| 4    | 2    |

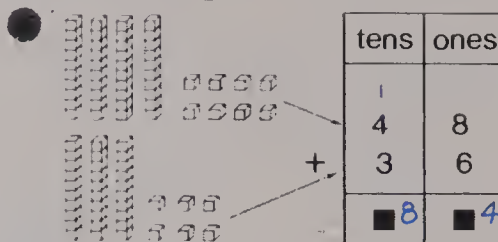
$$4 + 8 = 1 \text{ ten } 2 \text{ ones}$$

Copy and complete in a place-value chart. Watch for "extra tens".

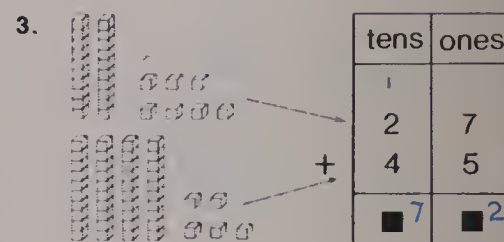


| tens | ones |
|------|------|
| 2    | 5    |
| 3    | 7    |
| 6    | 2    |

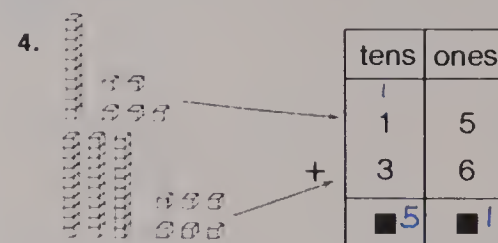
$$5 + 7 = 1 \text{ ten and } 2 \text{ ones}$$



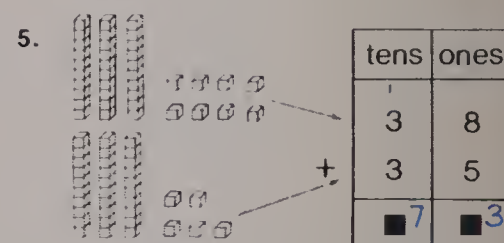
| tens | ones |
|------|------|
| 4    | 8    |
| 3    | 6    |
| 8    | 4    |



| tens | ones |
|------|------|
| 2    | 7    |
| 4    | 5    |
| 7    | 2    |



| tens | ones |
|------|------|
| 1    | 5    |
| 3    | 6    |
| 5    | 1    |



| tens | ones |
|------|------|
| 3    | 8    |
| 3    | 5    |
| 7    | 3    |

46 Regrouping

**Using the Book** Emphasize that the largest number that can be in the one's column is 9. Refer to the display. Discuss what can be done if you have more than 9. Use concrete materials to illustrate. Show how 12 ones can be traded for 1 ten and 2 ones.

Use the window sheet to isolate the numbers in the ten's column.

|   |   |   |
|---|---|---|
|   | 1 |   |
| + | 1 | 4 |
|   | 2 | 8 |
|   | 4 | 2 |

Put the "extra ten" in the ten's column and show how the second step in the question now involves the addition of 3 addends. (Refer to page 30 in Chapter 1.) Do Exercises 1-5 orally with the children telling you what is happening. Have a child complete each at the chalkboard or on the overhead.

# Bigger Numbers

Add these numbers.

$$47 + 25$$

|   | tens | ones |
|---|------|------|
| + | 4    | 7    |
|   | 2    | 5    |
|   |      | 2    |

First, add

$$7 + 5 = 12$$

$$12 = 1 \text{ ten and } 2 \text{ ones.}$$

Move the 1 ten to the ten's place.

|   | tens | ones |
|---|------|------|
| + | 4    | 7    |
|   | 2    | 5    |
|   | 7    | 2    |

Now, add the numbers in the ten's place.

$$47$$

$$\text{First, add } 4 + 2 \quad 4 + 2 = 6.$$

$$+25$$

$$\text{Now add } 6 + 1 \quad 6 + 1 = 7.$$

$$72$$

Put the "7" in the ten's place.

Copy and add.

- |  |  |   |   |   |   |
|--|--|---|---|---|---|
| 1. $\begin{array}{r} 67 \\ +25 \\ \hline 92 \end{array}$ | 2. $\begin{array}{r} 48 \\ +33 \\ \hline 81 \end{array}$ | 3. $\begin{array}{r} 32 \\ +29 \\ \hline 61 \end{array}$  | 4. $\begin{array}{r} 34 \\ +48 \\ \hline 82 \end{array}$  | 5. $\begin{array}{r} 56 \\ +36 \\ \hline 92 \end{array}$  | 6. $\begin{array}{r} 48 \\ +34 \\ \hline 82 \end{array}$    |
| 7. $\begin{array}{r} 19 \\ +36 \\ \hline 55 \end{array}$ | 8. $\begin{array}{r} 48 \\ +47 \\ \hline 95 \end{array}$ | 9. $\begin{array}{r} 28 \\ +63 \\ \hline 91 \end{array}$  | 10. $\begin{array}{r} 69 \\ +23 \\ \hline 92 \end{array}$ | 11. $\begin{array}{r} 16 \\ +79 \\ \hline 95 \end{array}$ | 12. $\begin{array}{r} 39 \\ +32 \\ \hline 71 \end{array}$   |
| 13. $\begin{array}{r} 55 \\ +8 \\ \hline 63 \end{array}$ | 14. $\begin{array}{r} 87 \\ +6 \\ \hline 93 \end{array}$ | 15. $\begin{array}{r} 68 \\ +25 \\ \hline 93 \end{array}$ | 16. $\begin{array}{r} 25 \\ +43 \\ \hline 68 \end{array}$ | 17. $\begin{array}{r} 13 \\ +75 \\ \hline 88 \end{array}$ | ★18. $\begin{array}{r} 99 \\ +99 \\ \hline 198 \end{array}$ |

Adding 2-digit numbers with regrouping 47

**Using the Book** Read through the display with the children discussing (a) ones first, then tens (b) trading (c) "helper" numbers placed above the ten's column. Ask, "What happened to 'the ten' from  $7 + 5$ ? (placed above the ten's column)" Assign the exercises. Children should work on graph paper (if available) for recording number work.

## OBJECTIVE

To add two-digit numbers with regrouping, using place-value charts

## PACING

Level A All

Level B All

Level C All

## MATERIALS

place-value charts

## RELATED AIDS

HMS—DM15.

BFA COMP LAB I—33, 34.

## SUGGESTIONS

**Initial Activity** Recall, if necessary, the events from page 46. Use cubes, blocks, or coloured stir sticks to review and demonstrate the "trading" of ten ones for a ten in such situations as  $8 + 7$ ,  $9 + 6$ ,  $15 + 8$ ,  $14 + 28$ , etc.

## ACTIVITIES

See page 46.

## EXTRA PRACTICE

Add.

- |  |  |
|--|--|
| 1. $\begin{array}{r} 74 \\ +18 \\ \hline \end{array}$  | 2. $\begin{array}{r} 65 \\ +29 \\ \hline \end{array}$  |
| 3. $\begin{array}{r} 27 \\ +36 \\ \hline \end{array}$  | 4. $\begin{array}{r} 53 \\ +27 \\ \hline \end{array}$  |
| 5. $\begin{array}{r} 18 \\ +33 \\ \hline \end{array}$  | 6. $\begin{array}{r} 61 \\ +19 \\ \hline \end{array}$  |
| 7. $\begin{array}{r} 82 \\ +9 \\ \hline \end{array}$   | 8. $\begin{array}{r} 55 \\ +25 \\ \hline \end{array}$  |
| 9. $\begin{array}{r} 48 \\ +37 \\ \hline \end{array}$  | 10. $\begin{array}{r} 29 \\ +34 \\ \hline \end{array}$ |
| 11. $\begin{array}{r} 62 \\ +18 \\ \hline \end{array}$ | 12. $\begin{array}{r} 74 \\ +17 \\ \hline \end{array}$ |
| 13. $\begin{array}{r} 26 \\ +55 \\ \hline \end{array}$ | 14. $\begin{array}{r} 87 \\ +5 \\ \hline \end{array}$  |



## OBJECTIVE

To add 2 three-digit numbers with regrouping in the ten's place

## PACING

Level A All  
Level B All  
Level C All

## MATERIALS

place-value charts, window sheet from page 46

## RELATED AIDS

BFA COMP LAB I—37.

## SUGGESTIONS

**Initial Activity** Review the idea of regrouping from the one's place to the ten's place as dealt with on pages 46 and 47. Use the window sheet to isolate the numbers in each column in turn. Ensure that regrouping will only be necessary in the ten's place (see examples at top of page 48).

Do several examples with the children, using a place-value chart, before assigning the page.

## ACTIVITIES

1. Use blank place-value charts (DM14) and have the children do the questions from Extra Practice. Let them use the mini-calculator to check.

2. Prepare addition puzzles such as the following. (Answers are given in brackets.)

|       |       |       |       |       |       |
|-------|-------|-------|-------|-------|-------|
| 239   | 224   | (463) | 213   | 119   | (332) |
| 209   | 319   | (528) | 103   | 236   | (339) |
| (448) | (543) | (991) | (316) | (355) | (671) |

3. Challenge: Write a flow chart for adding this:

$$\begin{array}{r} 534 \\ + 248 \\ \hline \end{array}$$

(See the flow chart in Activity 3, page 39.)

## EXTRA PRACTICE

Add.

- |  |  |
|--|--|
| 1. $\begin{array}{r} 137 \\ + 228 \\ \hline \end{array}$ | 2. $\begin{array}{r} 566 \\ + 327 \\ \hline \end{array}$ |
| 3. $\begin{array}{r} 219 \\ + 452 \\ \hline \end{array}$ | 4. $\begin{array}{r} 584 \\ + 107 \\ \hline \end{array}$ |
| 5. $\begin{array}{r} 29 \\ + 347 \\ \hline \end{array}$  | 6. $\begin{array}{r} 142 \\ + 638 \\ \hline \end{array}$ |
| 7. $\begin{array}{r} 418 \\ + 76 \\ \hline \end{array}$  | 8. $\begin{array}{r} 235 \\ + 455 \\ \hline \end{array}$ |
| 9. $\begin{array}{r} 824 \\ + 168 \\ \hline \end{array}$ | 10. $\begin{array}{r} 932 \\ + 48 \\ \hline \end{array}$ |

## Adding Hundreds

Add  $147 + 225$ .

|   | hundreds | tens | ones |
|---|----------|------|------|
| + | 1        | 4    | 7    |
|   | 2        | 2    | 5    |
|   |          |      | 2    |

Add ones.

$$7 + 5 = 12 = 1 \text{ ten and } 2 \text{ ones.}$$

Put the extra ten in the ten's place.

|   | hundreds | tens | ones |
|---|----------|------|------|
| + | 1        | 4    | 7    |
|   | 2        | 2    | 5    |
|   |          | 7    | 2    |

Add tens.

$$\begin{array}{r} 147 \\ + 225 \\ \hline 372 \end{array}$$

|   | hundreds | tens | ones |
|---|----------|------|------|
| + | 1        | 4    | 7    |
|   | 2        | 2    | 5    |
|   | 3        | 7    | 2    |

Add hundreds.

Copy and add.

- |  |  |  |   |   |
|--|--|--|---|---|
| 1. $\begin{array}{r} 148 \\ + 233 \\ \hline 381 \end{array}$ | 2. $\begin{array}{r} 332 \\ + 429 \\ \hline 761 \end{array}$ | 3. $\begin{array}{r} 434 \\ + 148 \\ \hline 582 \end{array}$ | 4. $\begin{array}{r} 656 \\ + 236 \\ \hline 892 \end{array}$  | 5. $\begin{array}{r} 148 \\ + 534 \\ \hline 682 \end{array}$  |
| 6. $\begin{array}{r} 228 \\ + 263 \\ \hline 491 \end{array}$ | 7. $\begin{array}{r} 642 \\ + 347 \\ \hline 989 \end{array}$ | 8. $\begin{array}{r} 419 \\ + 436 \\ \hline 855 \end{array}$ | 9. $\begin{array}{r} 716 \\ + 179 \\ \hline 895 \end{array}$  | 10. $\begin{array}{r} 239 \\ + 332 \\ \hline 571 \end{array}$ |
| 11. $\begin{array}{r} 445 \\ + 37 \\ \hline 482 \end{array}$ | 12. $\begin{array}{r} 276 \\ + 13 \\ \hline 289 \end{array}$ | 13. $\begin{array}{r} 25 \\ + 358 \\ \hline 383 \end{array}$ | 14. $\begin{array}{r} 409 \\ + 262 \\ \hline 671 \end{array}$ | 15. $\begin{array}{r} 515 \\ + 365 \\ \hline 880 \end{array}$ |

48 Adding 3 digits with regrouping in the ten's place

**Using the Book** Ask the children if they can tell the difference between the place-value charts in this display and those on page 47 (these have "hundreds"). Point out that the procedure here is the same as they have done before only now they are using three-digit numbers. Review; emphasize (a) ones first, then tens, then hundreds (b) trading (c) helper numbers written in above the ten's column.



# Post Office Clerk



● Guy bought 36 stamps.  
Maria bought 45 stamps.  
How many stamps did they  
both buy? **81**

2. Kim bought 63 stamps.  
Garnet bought 28 stamps.  
How many stamps did they  
both buy? **91**

3. Nadine bought 57 stamps.  
Michel bought 24 stamps.  
How many stamps did they  
both buy? **81**

4. Raj bought 254 stamps.  
Trevor bought 126 stamps.  
How many stamps did they  
both buy? **380**

● 
$$\begin{array}{r} 47 \\ + 14 \\ \hline 61 \end{array}$$

● 
$$\begin{array}{r} 8 \\ + 84 \\ \hline 92 \end{array}$$

7. 
$$\begin{array}{r} 17 \\ + 75 \\ \hline 92 \end{array}$$

8. 
$$\begin{array}{r} 35 \\ + 57 \\ \hline 92 \end{array}$$

9. 
$$\begin{array}{r} 29 \\ + 24 \\ \hline 53 \end{array}$$

10. 
$$\begin{array}{r} 508 \\ + 403 \\ \hline 911 \end{array}$$

11. 
$$\begin{array}{r} 206 \\ + 344 \\ \hline 550 \end{array}$$

12. 
$$\begin{array}{r} 604 \\ + 106 \\ \hline 710 \end{array}$$

13. 
$$\begin{array}{r} 238 \\ + 6 \\ \hline 244 \end{array}$$

14. 
$$\begin{array}{r} 7 \\ + 343 \\ \hline 350 \end{array}$$

**Using the Book** Ask a child to read a problem. Say, "Tell about the problem in your words." "What words tell you whether to add or subtract?" "What is happening in the problem that tells you what to do?" "Write a number story for the problem." "Write a sentence to answer the question."

## OBJECTIVE

To solve problems in addition involving regrouping

## PACING

Level A All  
Level B All  
Level C All

## MATERIALS

stamps, place-value chart

## RELATED AIDS

BFA COMP LAB I—34, 37.

## BACKGROUND

Using the concept expressed by "they both buy" we extend the purpose of addition in problem solving. It is the concept of combining or putting together.

## SUGGESTIONS

**Initial Activity** Discuss the work of a post office clerk by asking: "What hours does a post office clerk work? (review clock)" "Who does a clerk serve?" "Where does a clerk work?" "Does a clerk wear a uniform?" "How would a clerk use mathematics?"

## ACTIVITIES

1. Arrange to take your class to visit a post office. Have a discussion with the children to identify a set of questions the children will ask or try to answer while at the post office.

2. Have the class draw pictures or write a short story about what they saw at the post office.

3. Set up a post office, and have the children involved in solving problems similar to those on page 49 and in Extra Practice.

## EXTRA PRACTICE

1. There were 368 letters Monday.  
There were 224 letters Tuesday.  
How many letters altogether?
2. The post office clerk counted 257 large parcels and  
128 small parcels.  
How many parcels altogether?
3. The clerk sold 206 stamps on Thursday and 308 on Friday.  
How many stamps were sold altogether?



To use an “extra hundred” in regrouping

|         |     |
|---------|-----|
| Level A | All |
| Level B | All |
| Level C | All |

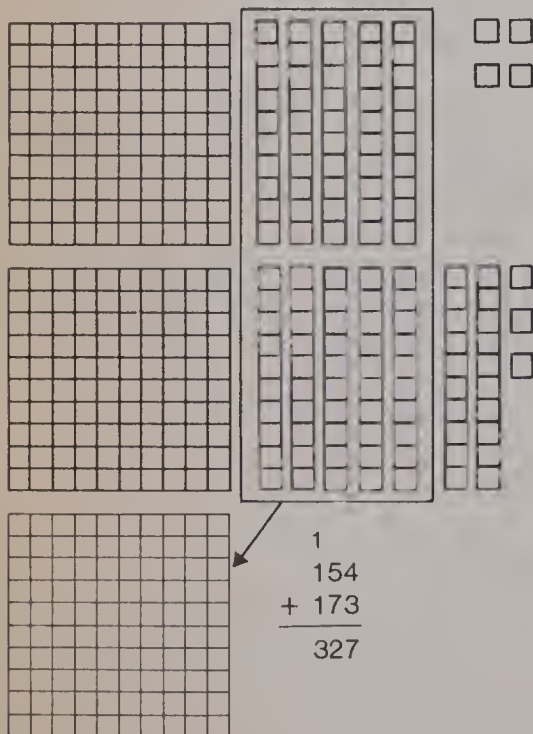
window sheet from page 46, place-value charts, flats, longs, and units

## HMS—DM14.

**Initial Activity** Show that 10 tens may be traded for 1 hundred. Then show that 12 tens may be traded for 1 hundred and 2 tens.

Use the window sheet to isolate numbers in each column. Refer to previous work done on page 46. Do several examples using a place-value chart. If the children experience any difficulty, use flats (100), longs (10), and ones to demonstrate the process (DM2).

### Example



1. Provide the children with cardboard flats (100's), longs (10's), and ones (1's). They are to illustrate each.

$$\begin{array}{r} 143 \\ + 293 \\ \hline \end{array} \quad \begin{array}{r} 450 \\ + 263 \\ \hline \end{array} \quad \begin{array}{r} 274 \\ + 383 \\ \hline \end{array}$$

Use place-value charts and coloured stir sticks to illustrate each.

(Extension)

$$\begin{array}{r} 432 \\ + 219 \\ \hline \end{array} \qquad \begin{array}{r} 290 \\ + 490 \\ \hline \end{array} \qquad \begin{array}{r} 272 \\ + 345 \\ \hline \end{array}$$

| hundreds | tens | ones |
|----------|------|------|
| 1        | 5    | 4    |
| 1        | 7    | 3    |
| 3        | 2    | 7    |

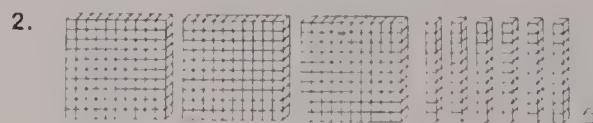
$$5 \text{ tens} + 7 \text{ tens} = 1 \text{ hundred } 2 \text{ tens}$$

Copy and complete. Watch for “extra hundreds”.



| hundreds | tens | ones |
|----------|------|------|
| 2        | 6    | 3    |
| 3        | 6    | 6    |
| ■ 6      | ■ 2  | ■ 9  |

6 tens + 6 tens = 1 hundred 2 tens



| hundreds | tens | ones |
|----------|------|------|
| 3        | 6    | 1    |
|          | 5    | 4    |
| ■ 4      | ■ 1  | ■ 5  |

50 Regrouping

**Using the Book** Do page 50 orally. The questioning might go like this: (Refer to the display.) “What two numbers are we adding? (154 and 173)” “Where are the two numbers shown? (2 places)” “How many ones altogether? (7) tens? (12)” “How can we regroup 12 tens? (one hundred and 2 tens)” “What is another name for 10 tens? (1 hundred)” “Where do we show the extra hundred? (1 above the hundred’s column)” “How many hundreds altogether? (3)” “What is the sum? (327)”

2. Make a matching game with 20 cards as illustrated.

|                |                   |     |
|----------------|-------------------|-----|
| 20 ones        | 2 tens            | 20  |
| 10 tens        | 1 hundred         | 100 |
| 30 tens 5 tens | 3 hundreds 5 tens | 350 |

Children are to match the cards.

3. Play the "Missing Numbers" game in the Activity Reservoir.



# Practice

- |   |  |  |  |  |
|---|--|--|--|--|
| 1. (a) $\begin{array}{r} 24 \\ +91 \\ \hline 115 \end{array}$   | (b) $\begin{array}{r} 32 \\ +85 \\ \hline 117 \end{array}$   | (c) $\begin{array}{r} 47 \\ +72 \\ \hline 119 \end{array}$   | (d) $\begin{array}{r} 56 \\ +83 \\ \hline 139 \end{array}$   | (e) $\begin{array}{r} 25 \\ +91 \\ \hline 116 \end{array}$   |
| 2. (a) $\begin{array}{r} 61 \\ +87 \\ \hline 148 \end{array}$   | (b) $\begin{array}{r} 74 \\ +52 \\ \hline 126 \end{array}$   | (c) $\begin{array}{r} 52 \\ +83 \\ \hline 135 \end{array}$   | (d) $\begin{array}{r} 33 \\ +44 \\ \hline 77 \end{array}$    | (e) $\begin{array}{r} 51 \\ +98 \\ \hline 149 \end{array}$   |
| 3. (a) $\begin{array}{r} 437 \\ +92 \\ \hline 529 \end{array}$  | (b) $\begin{array}{r} 245 \\ +83 \\ \hline 328 \end{array}$  | (c) $\begin{array}{r} 133 \\ +56 \\ \hline 189 \end{array}$  | (d) $\begin{array}{r} 382 \\ +45 \\ \hline 427 \end{array}$  | (e) $\begin{array}{r} 526 \\ +92 \\ \hline 618 \end{array}$  |
| 4. (a) $\begin{array}{r} 234 \\ +180 \\ \hline 414 \end{array}$ | (b) $\begin{array}{r} 552 \\ +143 \\ \hline 695 \end{array}$ | (c) $\begin{array}{r} 756 \\ +182 \\ \hline 938 \end{array}$ | (d) $\begin{array}{r} 461 \\ +274 \\ \hline 735 \end{array}$ | (e) $\begin{array}{r} 145 \\ +392 \\ \hline 537 \end{array}$ |
| 5. (a) $\begin{array}{r} 364 \\ +265 \\ \hline 629 \end{array}$ | (b) $\begin{array}{r} 127 \\ +491 \\ \hline 618 \end{array}$ | (c) $\begin{array}{r} 341 \\ +486 \\ \hline 827 \end{array}$ | (d) $\begin{array}{r} 265 \\ +393 \\ \hline 658 \end{array}$ | (e) $\begin{array}{r} 674 \\ +285 \\ \hline 959 \end{array}$ |

6. Yvonne has 482 stamps.  
Leo has 474 stamps.  
How many stamps do they both have? **956**

7. Carlos has 261 stamps.  
Pierre has 397 stamps.  
How many stamps do they both have? **658**

## BRAINTICKLER

What is the number?

- Double the number in the ten's place to get the number in the hundred's place.
- The number in the hundred's place is 7 more than the number in the one's place. **841**

## OBJECTIVE

To practise addition with regrouping (renaming tens)

## PACING

Level A All  
Level B All  
Level C 3-7

## RELATED AIDS

BFA COMP LAB I—22, 30, 35.

## EXTRA PRACTICE

Add.

- |  |  |
|--|--|
| 1. $\begin{array}{r} 83 \\ +45 \\ \hline \end{array}$    | 2. $\begin{array}{r} 61 \\ +57 \\ \hline \end{array}$    |
| 3. $\begin{array}{r} 45 \\ +73 \\ \hline \end{array}$    | 4. $\begin{array}{r} 38 \\ +91 \\ \hline \end{array}$    |
| 5. $\begin{array}{r} 53 \\ +74 \\ \hline \end{array}$    | 6. $\begin{array}{r} 174 \\ +85 \\ \hline \end{array}$   |
| 7. $\begin{array}{r} 234 \\ +75 \\ \hline \end{array}$   | 8. $\begin{array}{r} 781 \\ +48 \\ \hline \end{array}$   |
| 9. $\begin{array}{r} 498 \\ +71 \\ \hline \end{array}$   | 10. $\begin{array}{r} 166 \\ +72 \\ \hline \end{array}$  |
| 11. $\begin{array}{r} 782 \\ +156 \\ \hline \end{array}$ | 12. $\begin{array}{r} 635 \\ +283 \\ \hline \end{array}$ |
| 13. $\begin{array}{r} 157 \\ +462 \\ \hline \end{array}$ | 14. $\begin{array}{r} 543 \\ +164 \\ \hline \end{array}$ |
| 15. $\begin{array}{r} 297 \\ +131 \\ \hline \end{array}$ | 16. $\begin{array}{r} 345 \\ +574 \\ \hline \end{array}$ |
| 17. $\begin{array}{r} 736 \\ +192 \\ \hline \end{array}$ | 18. $\begin{array}{r} 256 \\ +291 \\ \hline \end{array}$ |
| 19. $\begin{array}{r} 874 \\ +85 \\ \hline \end{array}$  | 20. $\begin{array}{r} 831 \\ +95 \\ \hline \end{array}$  |

Practice 51

**Using the Book** The children should work independently on these questions. If any children have unusual difficulty with this page, you may want to set up remedial work based on the type of questions found on this page.

OBJECTIVE

To find the sum of three-digit numbers with regrouping in two places

PACING

- Level A 1-27
- Level B All
- Level C 13-32

MATERIALS

coloured transparent window sheet (page 46), place-value charts

RELATED AIDS

- HMS—DM14.
- BFA COMP LAB I—38.

SUGGESTIONS

**Initial Activity** Review briefly the addition of three addends and the meaning of place value to hundreds as previously discussed.

ACTIVITIES

1. Have two children draw their own place-value charts as illustrated in Exercise 1. Provide the children with a set of cards with a three-digit number on each. Each child draws two cards, enters the numbers in the place-value chart, and adds. Each does 5 questions. They exchange and correct each other's work with a mini-calculator. The child with the most correct is the winner.

2. Have a set of cards with three-digit numbers on them. The children draw two cards and add the numbers. Some questions will involve regrouping and some will not.

Example    424    368

424

+ 368

792

Allow children to use a mini-calculator to check.

3. Provide this crossnumber puzzle. Answers are given.

|          |   |          |          |          |          |
|----------|---|----------|----------|----------|----------|
| <b>a</b> | 4 | 0        | <b>b</b> | 6        |          |
|          |   |          | 1        |          |          |
|          |   | <b>c</b> | <b>d</b> | <b>e</b> |          |
|          |   | 4        | 5        | 8        |          |
|          |   |          | <b>f</b> |          | <b>g</b> |
|          |   |          | 3        | 2        | 4        |
|          |   |          | <b>h</b> |          |          |
|          |   |          | 4        | 1        | 4        |
|          |   |          |          |          | 1        |

ACROSS

- a 288 + 118
- c 247 + 211
- f ■ + 430 = 754
- h 208 + ■ = 662

DOWN

- b 235 + ■ = 849
- d 388 + 146
- e 155 + 666
- g ■ + 520 = 961

EXTRA PRACTICE

Add. (Extension)

1. 794

+ 528

5. 800

+ 400

9. 762

+ 237
2. 674

+ 945

6. 880

+ 220

10. 835

+ 588
3. 799

+ 201

7. 789

+ 987
4. 404

+ 707

8. 323

+ 415

Adding Hundreds

Add 527 + 385.

|   |          |      |      |
|---|----------|------|------|
|   | hundreds | tens | ones |
|   | 5        | 2    | 7    |
| + | 3        | 8    | 5    |
|   |          |      | 2    |

Add the numbers in the one's place.

7 + 5 = 12  
12 = 1 ten and 2 ones.

Put the "2" in the one's place and move the 1 ten to the ten's place.

|   |          |      |      |
|---|----------|------|------|
|   | hundreds | tens | ones |
|   | 5        | 2    | 7    |
| + | 3        | 8    | 5    |
|   |          | 1    | 2    |

Now, add the numbers in the ten's place.

1 + 2 + 8 = 11  
11 tens = 1 hundred and 1 ten.

Put the "1" in the ten's place and move the 1 hundred to the hundred's place.

|   |          |      |      |
|---|----------|------|------|
|   | hundreds | tens | ones |
|   | 1        | 1    |      |
|   | 5        | 2    | 7    |
| + | 3        | 8    | 5    |
|   | 9        | 1    | 2    |

Now, add the numbers in the hundred's place.

1 + 5 + 3 = 9  
9 hundreds.

Put the "9" in the hundred's place.

This is what you did.

527

+ 385

912

Put any extra "tens" in the ten's place.

Put any extra "hundreds" in the hundred's place.

52 Adding 3-digit numbers with regrouping in two places

**Using the Book** Using a place-value chart and the window sheet, demonstrate the example at the top of page 52. Emphasize the need to keep the numbers in line and the concept of putting any "extra tens" in the ten's column and any "extra hundreds" in the hundred's column. Develop a flow chart to outline these steps. Have a child tell you what to do for each step in the example on page 52. In responding to your questioning, they should tell you that the ones are regrouped giving an extra ten, and the tens are regrouped giving an extra hundred.

The children may need graph paper in order to copy and add the three-digit numbers in an acceptable manner.

You may wish to assign this page over two separate days.

Copy and complete.

1. 
$$\begin{array}{r} 345 \\ + 298 \\ \hline 643 \\ + \end{array}$$

| hundreds | tens | ones |
|----------|------|------|
| 3        | 4    | 5    |
| 2        | 9    | 8    |
| ■ 6      | ■ 4  | ■ 3  |

2. 
$$\begin{array}{r} 258 \\ + 476 \\ \hline 734 \\ + \end{array}$$

| hundreds | tens | ones |
|----------|------|------|
| 2        | 5    | 8    |
| 4        | 7    | 6    |
| ■ 7      | ■ 3  | ■ 4  |

3. 
$$\begin{array}{r} 124 \\ + 377 \\ \hline 501 \end{array}$$

● 
$$\begin{array}{r} 356 \\ + 256 \\ \hline 612 \end{array}$$

● 
$$\begin{array}{r} 489 \\ + 143 \\ \hline 632 \end{array}$$

● 
$$\begin{array}{r} 784 \\ + 129 \\ \hline 913 \end{array}$$

● 
$$\begin{array}{r} 281 \\ + 359 \\ \hline 640 \end{array}$$

8. 
$$\begin{array}{r} 568 \\ + 263 \\ \hline 831 \end{array}$$

9. 
$$\begin{array}{r} 134 \\ + 638 \\ \hline 772 \end{array}$$

10. 
$$\begin{array}{r} 136 \\ + 452 \\ \hline 588 \end{array}$$

11. 
$$\begin{array}{r} 289 \\ + 643 \\ \hline 932 \end{array}$$

12. 
$$\begin{array}{r} 549 \\ + 237 \\ \hline 786 \end{array}$$

13. 
$$\begin{array}{r} 363 \\ + 486 \\ \hline 849 \end{array}$$

14. 
$$\begin{array}{r} 379 \\ + 436 \\ \hline 815 \end{array}$$

15. 
$$\begin{array}{r} 274 \\ + 191 \\ \hline 465 \end{array}$$

16. 
$$\begin{array}{r} 468 \\ + 236 \\ \hline 704 \end{array}$$

17. 
$$\begin{array}{r} 634 \\ + 127 \\ \hline 761 \end{array}$$

18. 
$$\begin{array}{r} 562 \\ + 129 \\ \hline 691 \end{array}$$

19. 
$$\begin{array}{r} 117 \\ + 146 \\ \hline 263 \end{array}$$

20. 
$$\begin{array}{r} 235 \\ + 165 \\ \hline 400 \end{array}$$

21. 
$$\begin{array}{r} 348 \\ + 433 \\ \hline 781 \end{array}$$

22. 
$$\begin{array}{r} 776 \\ + 143 \\ \hline 919 \end{array}$$

23. 
$$\begin{array}{r} 467 \\ + 312 \\ \hline 779 \end{array}$$

24. 
$$\begin{array}{r} 669 \\ + 242 \\ \hline 911 \end{array}$$

25. 
$$\begin{array}{r} 181 \\ + 209 \\ \hline 390 \end{array}$$

26. 
$$\begin{array}{r} 425 \\ + 192 \\ \hline 617 \end{array}$$

27. 
$$\begin{array}{r} 641 \\ + 189 \\ \hline 830 \end{array}$$

28. 
$$\begin{array}{r} 432 \\ + 89 \\ \hline 521 \end{array}$$

29. 
$$\begin{array}{r} 374 \\ + 46 \\ \hline 420 \end{array}$$

30. 
$$\begin{array}{r} 87 \\ + 213 \\ \hline 300 \end{array}$$

31. 
$$\begin{array}{r} 492 \\ + 8 \\ \hline 500 \end{array}$$

★ 32. 
$$\begin{array}{r} 999 \\ + 99 \\ \hline 1098 \end{array}$$



OBJECTIVE

To practise adding three-digit numbers

PACING

Level A (a), (b), (c), (d) in each row  
Level B All  
Level C 4-7

EXTRA PRACTICE

Extension

|                 |                  |                 |                 |
|-----------------|------------------|-----------------|-----------------|
| 1. 800<br>+ 700 | 2. 900<br>+ 600  | 3. 940<br>+ 790 | 4. 680<br>+ 310 |
| 5. 850<br>+ 870 | 6. 984<br>+ 238  | 7. 796<br>+ 945 | 8. 502<br>+ 206 |
| 9. 403<br>+ 809 | 10. 707<br>+ 747 |                 |                 |

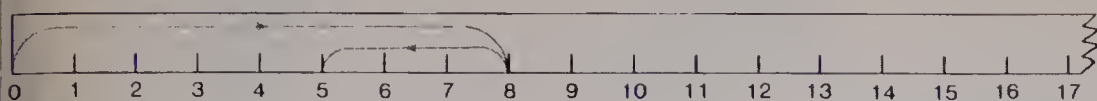
Addition Practice

|                            |                         |                         |                         |                         |                         |
|----------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| 1. (a) 46<br>+ 12<br>58    | (b) 72<br>+ 24<br>96    | (c) 35<br>+ 14<br>49    | (d) 42<br>+ 30<br>72    | (e) 26<br>+ 53<br>79    | (f) 60<br>+ 17<br>77    |
| 2. (a) 134<br>+ 21<br>155  | (b) 303<br>+ 24<br>327  | (c) 268<br>+ 20<br>288  | (d) 452<br>+ 45<br>497  | (e) 237<br>+ 52<br>289  | (f) 564<br>+ 30<br>594  |
| 3. (a) 336<br>+ 423<br>759 | (b) 147<br>+ 342<br>489 | (c) 514<br>+ 205<br>719 | (d) 268<br>+ 421<br>689 | (e) 194<br>+ 103<br>297 | (f) 303<br>+ 425<br>728 |
| 4. (a) 264<br>+ 127<br>391 | (b) 548<br>+ 204<br>752 | (c) 426<br>+ 139<br>565 | (d) 168<br>+ 218<br>386 | (e) 453<br>+ 139<br>592 | (f) 329<br>+ 244<br>573 |
| 5. (a) 458<br>+ 271<br>729 | (b) 524<br>+ 182<br>706 | (c) 143<br>+ 382<br>525 | (d) 360<br>+ 154<br>514 | (e) 294<br>+ 482<br>776 | (f) 571<br>+ 187<br>758 |
| 6. (a) 136<br>+ 79<br>215  | (b) 458<br>+ 286<br>744 | (c) 276<br>+ 156<br>432 | (d) 369<br>+ 243<br>612 | (e) 283<br>+ 468<br>751 | (f) 572<br>+ 279<br>851 |
| 7. (a) 452<br>+ 168<br>620 | (b) 396<br>+ 119<br>515 | (c) 285<br>+ 486<br>771 | (d) 436<br>+ 284<br>720 | (e) 325<br>+ 499<br>824 | (f) 457<br>+ 288<br>745 |

**Using the Book** The children should work independently on these questions. If any children have unusual difficulty with this page, you may want to set up remedial work based on the type of questions found on this page.

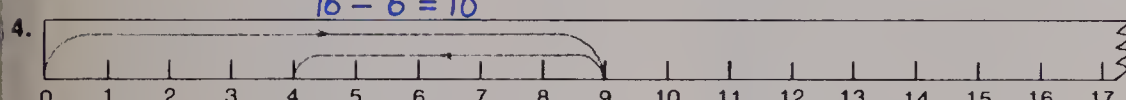
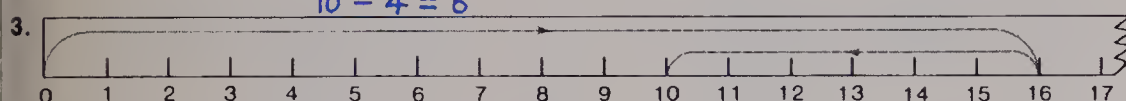
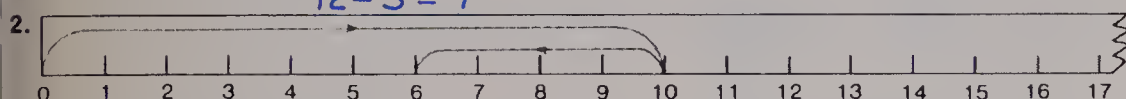
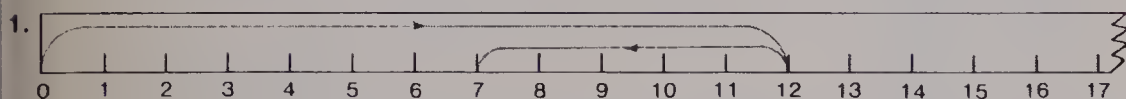
# Subtracting on Your Ruler

You can use a ruler to help you subtract.  
Just follow the bouncing arrow.  
It will bounce back when you take away.



You jump "8" spaces.  $8$   
Now you jump back "3" spaces.  $-3$        $8 - 3 = 5$   
The answer is "5".

Write the "number stories" for these.



Subtract.

|                                |                                |                                |                                |
|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| ● $8 - 5 = \blacksquare 3$     | ● $9 - 6 = \blacksquare 3$     | ● $10 - 2 = \blacksquare 8$    | 8. $7 - 4 = \blacksquare 3$    |
| 9. $5 - 3 = \blacksquare 2$    | 10. $10 - 6 = \blacksquare 4$  | 11. $8 - 2 = \blacksquare 6$   | 12. $4 - 3 = \blacksquare 1$   |
| 13. $17 - 4 = \blacksquare 13$ | 14. $15 - 4 = \blacksquare 11$ | 15. $16 - 3 = \blacksquare 13$ | 16. $15 - 2 = \blacksquare 13$ |

Subtracting on a centimetre ruler 55

**Using the Book** Refer to the display. Identify the problem:  $8 - 3$ . Direct the children to let their forefinger follow the arrow from 0 over 8 spaces to 8. This is the number we subtract from. They then move the finger back 3 spaces. This is the number they subtract. The answer is 5 – 5 spaces from 0.  
Assign the page. Take aside any children still having difficulties and repeat to clarify the above process until children can progress on their own.

## OBJECTIVE

To review and reinforce subtracting,  
using a ruler

## PACING

Level A All  
Level B All  
Level C Optional

## MATERIALS

1 ruler for each child, paper strip  
number line

## RELATED AIDS

BFA COMP LAB I—46.

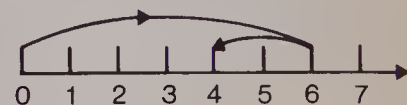
## BACKGROUND

Here the ruler is used as a concrete  
and relevant aid to reinforce the  
concept of subtraction.

## SUGGESTIONS

**Initial Activity** Review the idea that  
the end of the ruler would be the  
position of "zero" and that the  
number of spaces jumped is the  
important idea.

*Example*



$6 \text{ (spaces)} - 2 \text{ (spaces)} = 4$   
Do several examples with the  
children before assigning the page.

You may wish to indicate the  
relation between addition and  
subtraction:

$8 - 3 = 5$ .  $5 + 3 = 8$ .  
This is used as a check for subtraction.

## ACTIVITIES

1. Place a paper strip number line on  
the floor. A child starting at 0 steps 9  
steps (units) and then steps *back* 3  
steps. Directly above on the  
chalkboard is a number line on which  
another child illustrates by drawing a  
bouncing arrow from 0 to 9 and back  
3 spaces to 6. A number sentence is  
written under the number line. Repeat  
with other children and other  
numbers.

2. Provide dittoed sheets of  
number lines. Children are to draw  
bouncing arrows to show the  
subtraction problems you assign.

3. Ask the children to "check"  
the answers by writing the related  
addition sentence:  
 $8 - 5 = 3$ ,  $3 + 5 = 8$  checks.

## OBJECTIVE

To subtract a one-digit number from a two-digit number without regrouping

## PACING

Level A All  
Level B All  
Level C 1-5, 11-15

## MATERIALS

window sheet from page 46, graph paper, counters

## RELATED AIDS

HMS—DM16.  
BFA COMP LAB I—50.

## SUGGESTIONS

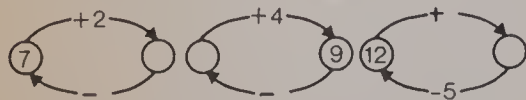
**Initial Activity** Review the idea of subtraction in terms of "taking away". Put 15 markers on the desk. Ask a child to "take away" 4 markers. How many are left? Write the number sentence in both the vertical and the horizontal forms. Repeat this procedure until you feel the students are comfortable with this operation.

## ACTIVITIES

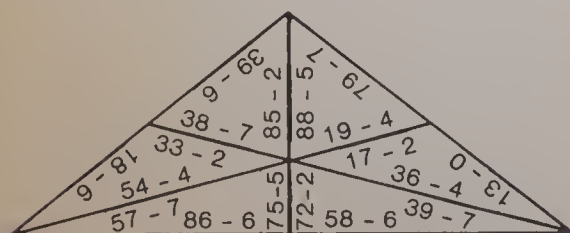
1. Provide or have children draw this pattern:



Demonstrate how this shows the relationship between addition and subtraction. Provide the children with 2 or more numbers. Children are to complete the chart.



2. Construct this puzzle from cardboard. Cut it out and then cut on all solid lines to form six smaller triangles. Children are to reconstruct the original shape by placing together two sides with the same answers.



3. Subtract the numbers on the side from the numbers on the top line.

|   |   |    |    |    |    |
|---|---|----|----|----|----|
| — | 6 | 27 | 19 | 38 | 26 |
| 5 |   |    |    | 33 |    |
| 3 |   | 24 |    |    |    |
| 1 |   |    |    |    |    |
| 4 |   |    | 15 |    |    |
| 2 |   |    |    |    |    |

## Subtracting

First, there were 14 balloons.

Then, 2 balloons broke.

Now there are 12 balloons.

$$\begin{array}{r} 14 \\ - 2 \\ \hline 12 \end{array}$$



1 4 First, subtract the numbers in the one's place.  
- 2 4 - 2 = 2

Put the "2" under the line in the one's place.

1 4 Now subtract the numbers in the ten's place.

- 2 There is nothing to "take away" from 1.

Write the "1" under the line in the ten's place.

Subtract. Remember to keep the numbers in their places.  
Use your ruler to check Questions 1 through 5.

|                          |                          |                          |                          |                          |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. 15<br>- 3<br>—<br>12  | 2. 16<br>- 3<br>—<br>13  | 3. 19<br>- 6<br>—<br>13  | 4. 18<br>- 4<br>—<br>14  | 5. 16<br>- 2<br>—<br>14  |
| 6. 48<br>- 5<br>—<br>43  | 7. 67<br>- 4<br>—<br>63  | 8. 98<br>- 2<br>—<br>96  | 9. 47<br>- 5<br>—<br>42  | 10. 39<br>- 4<br>—<br>35 |
| 11. 26<br>- 2<br>—<br>24 | 12. 57<br>- 3<br>—<br>54 | 13. 39<br>- 5<br>—<br>34 | 14. 68<br>- 3<br>—<br>65 | 15. 45<br>- 2<br>—<br>43 |

56 Subtraction: 1 digit from 2 digits

**Using the Book** Demonstrate the problem at the top of page 56 using pictures, and record numerically. Isolate the numbers in the one's column and then in the ten's column. (See page 46 for illustrations.)

Have the children suggest other questions and repeat the procedure.

## EXTRA PRACTICE

Subtract.

|                   |                    |
|-------------------|--------------------|
| 1. 27<br>- 5<br>— | 2. 36<br>- 3<br>—  |
| 3. 49<br>- 8<br>— | 4. 35<br>- 4<br>—  |
| 5. 68<br>- 4<br>— | 6. 76<br>- 2<br>—  |
| 7. 47<br>- 5<br>— | 8. 29<br>- 8<br>—  |
| 9. 18<br>- 7<br>— | 10. 59<br>- 8<br>— |

Also do HMS—DM16.



# Lost and Found Mysteries

- Jane had 14 buttons on her coat.  
She lost 2 buttons.  
How many does she have now?
- There were 28 mittens lost at school.  
8 mittens were found.  
How many were not found? **20**
- There were 49 shoes in the "Lost" room.  
6 were claimed.  
How many are still in the "Lost" room? **43**
- 26 books were lost.  
4 books were found.  
How many books are still lost? **22**
- There were 27 bicycles lost.  
The police found 7.  
How many are still lost? **20**
- 44 pens were lost.  
4 pens were found.  
How many pens are still lost? **40**
- Mary had 46 marbles.  
She lost 5.  
How many does she have now? **41**



$$\begin{array}{r} 14 \\ - 2 \\ \hline 12 \end{array}$$



Subtraction problems 57

**Using the Book** Demonstrate the first question on page 57 using buttons and a cutout of a coat. Discuss the elements of the problem and why it is necessary to include all of these elements.

Record numerically.

There are two types of problems on this page. Demonstrate Exercise 2 also. Discuss how Exercise 2 and Exercise 3 are alike. How does Exercise 1 differ from Exercise 2?

## OBJECTIVE

To solve problems in subtraction with no regrouping

## PACING

Level A 1-4  
Level B 1-4  
Level C All

## VOCABULARY

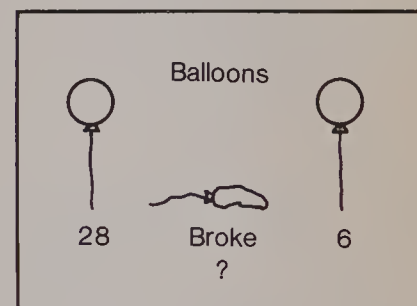
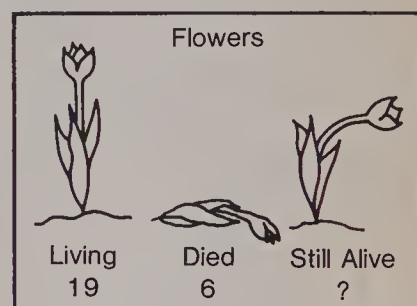
mysteries

## MATERIALS

counters, place-value charts

## ACTIVITIES

1. Make a set of picture cards to portray information. Each card is missing one number. Use a minimum of words. Children are to write number sentences.



2. Prepare a stack of several cards such as:

John has 17 \_\_\_\_\_.  
He loses 6 \_\_\_\_\_.  
He has ■ \_\_\_\_\_ left.

Children use such cards to write their own word problem for contribution to the "Mystery Centre".

3. Prepare cards such as:

- 26, 4
- 19, 7
- 38, 5

Children are required to write (and solve) 3 word problems using the numbers given. Again, original, well-produced problems go to the "Mystery Centre".

## OBJECTIVE

To subtract two-digit numbers

## PACING

Level A All  
Level B All  
Level C All

## MATERIALS

centimetre cubes, graph paper, cardboard longs and ones (DM2)

## RELATED AIDS

HMS—DM2.  
BFA COMP LAB I—51.

## SUGGESTIONS

**Initial Activity** Review place value by showing the children 3 longs (30) and 6 ones. Ask what number these represent. (36) Ask a child to "take away" 12. (Take away 2 ones and 1 long.)

Ask children to show 47, 29, 50, 19, 32 using longs and ones.

## ACTIVITIES

1. Copy on graph paper and fill in the missing numbers:

|    |    |    |    |    |
|----|----|----|----|----|
| —  | 67 | 89 | 98 | 79 |
| 24 |    |    | 74 |    |
| 11 |    | 78 |    |    |
| 32 |    |    |    | 47 |
| 43 | 24 |    |    |    |

2. Use the Abacus from Activity 2, page 15, to subtract.

|     |     |     |     |     |
|-----|-----|-----|-----|-----|
| 27  | 38  | 44  | 58  | 46  |
| -13 | -15 | -24 | -37 | -42 |

3. Provide the students with these puzzles. The operation is subtraction. Answers are given in brackets.

|   |     |     |     |
|---|-----|-----|-----|
| — | 9   | 6   | (3) |
|   | 5   | 3   | (2) |
|   | (4) | (3) | (1) |

|   |     |     |     |
|---|-----|-----|-----|
| — | 8   | 5   | (3) |
|   | 4   | 3   | (1) |
|   | (4) | (2) | (2) |

Ask the child to make up his own puzzle that works!

## Subtracting Large Numbers

Susan counted 44 centimetre cubes.

Kevin took away 12 red centimetre cubes.

How many are left?

|   | tens | ones |
|---|------|------|
|   | 4    | 4    |
| - | 1    | 2    |
|   |      | 2    |

First look at the one's place.

$$4 - 2 = 2$$

Put the "2" in the one's place.

|   | tens | ones |
|---|------|------|
|   | 4    | 4    |
| - | 1    | 2    |
|   | 3    | 2    |

Now look at the ten's place.

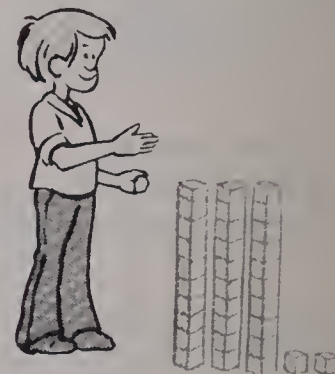
$$4 - 1 = 3$$

Put the "3" in the ten's place.

So

|     |
|-----|
| 44  |
| -12 |
| —   |
| 32  |

There were 32 left.



|                         |                         |                         |                         |                          |
|-------------------------|-------------------------|-------------------------|-------------------------|--------------------------|
| 1. 56<br>-21<br>—<br>35 | 2. 97<br>-24<br>—<br>73 | 3. 46<br>-23<br>—<br>23 | 4. 38<br>-20<br>—<br>18 | 5. 24<br>-13<br>—<br>11  |
| 6. 89<br>-65<br>—<br>24 | 7. 54<br>-40<br>—<br>14 | 8. 68<br>-22<br>—<br>46 | 9. 27<br>-12<br>—<br>15 | 10. 45<br>-32<br>—<br>13 |

58 Subtraction 2 digits from 2 digits

**Using the Book** Have the children "build" the problem at the top of the page using centimetre cubes, and work through the question concretely. Record numerically in a place-value chart as shown. Do further examples before assigning the page. Have the children use graph paper to help them in isolating the numbers in the one's place and the ten's place. Ensure that none of the examples will require regrouping.

## EXTRA PRACTICE

Subtract.

|                   |                    |                    |                    |
|-------------------|--------------------|--------------------|--------------------|
| 1. 75<br>-21<br>— | 2. 88<br>-54<br>—  | 3. 63<br>-22<br>—  | 4. 57<br>-36<br>—  |
| 5. 97<br>-54<br>— | 6. 38<br>-17<br>—  | 7. 79<br>-47<br>—  | 8. 54<br>-13<br>—  |
| 9. 29<br>-14<br>— | 10. 85<br>-43<br>— | 11. 76<br>-16<br>— | 12. 58<br>-31<br>— |



# The Metre



Use a metrestick.

- Are you taller than one metre?
- We write "m" as the symbol for "metre". Measure and record the lengths in metres of four things in your classroom.
- Which is the better unit, the centimetre or metre, for measuring each?
  - length of your shoe **centimetre**
  - length of a pencil **centimetre**
  - length of the chalkboard **metre**
  - length of a car **metre**
  - length of the school **metre**
  - height of a dog **centimetre**

Mark measured his school.

The gym was 36 m long.

The hall was 26 m long.

How long are the two together? **62 m**

Johnny made these addition and subtraction questions when he measured in metres. Help him find the answers.

$$\begin{array}{r} 35 \\ + 56 \\ \hline 91 \end{array}$$

$$\begin{array}{r} 123 \\ + 141 \\ \hline 264 \end{array}$$

$$\begin{array}{r} 7. \quad 128 \\ + 34 \\ \hline 162 \end{array}$$

$$\begin{array}{r} 8. \quad 151 \\ + 263 \\ \hline 414 \end{array}$$

$$\begin{array}{r} 9. \quad 164 \\ + 178 \\ \hline 342 \end{array}$$

$$\begin{array}{r} 10. \quad 76 \\ - 32 \\ \hline 44 \end{array}$$

$$\begin{array}{r} 11. \quad 84 \\ - 21 \\ \hline 63 \end{array}$$

$$\begin{array}{r} 12. \quad 58 \\ - 16 \\ \hline 42 \end{array}$$

$$\begin{array}{r} 13. \quad 29 \\ - 14 \\ \hline 15 \end{array}$$

$$\begin{array}{r} 14. \quad 39 \\ - 18 \\ \hline 21 \end{array}$$

Introducing the metre 59

**Using the Book** Assign the exercises being sure that the children can read and understand all words on the page (see Vocabulary). Children may want to look up the answers to Exercises 4, 5 and 6 as a check as to how they are doing.

- Provide a series of "personalized" instruction cards such as:

How far in metres from your desk to Mr./Mrs. \_\_\_\_\_'s desk?

How far in metres from \_\_\_\_\_'s desk to \_\_\_\_\_'s desk?

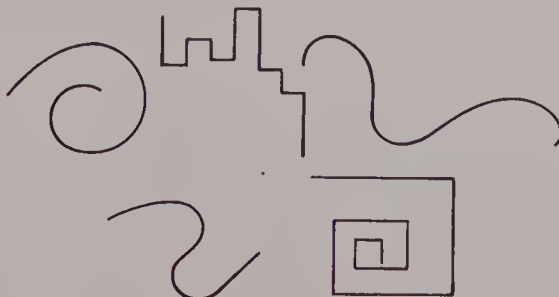
How far from our room to Mr./Mrs. \_\_\_\_\_'s office?

etc.

- Trundle Wheel** If children have had little experience with a trundle wheel, let them pick their own starting and ending points. Encourage them to record findings.

Use chart—extend into mapping, making graphs, marking off other distances to match those in the chart.

- The children should have experience in measuring curved or zigzag lines. Using masking tape to lay out a variety of shapes on the floor.



| Start          | Finish      | No. of Metres |
|----------------|-------------|---------------|
| Class door     | End of hall | 6             |
| Teacher's desk | Chalkboard  | 2             |

Tell children they must figure out how to measure these. Have them estimate first!

Let children draw their own shapes, and then estimate and measure their lengths.

## OBJECTIVES

To use the metre as a standard unit of length

To estimate the length of objects suitable for measurement in metres

To practise addition and subtraction

## PACING

Level A All

Level B All

Level C 1-4

## VOCABULARY

record, chalkboard, gym, length, height

## MATERIALS

string or heavy cord — 1 m per child, metrestick

## BACKGROUND

The metric salute is the positioning of the arms when holding the metre string as indicated. Each child should develop a metric salute which identifies a metre of length.



## SUGGESTIONS

**Initial Activity** Each child should have his own metre string so he can use it to measure various objects. This would be an ideal time to emphasize that 1 m = 100 cm. Have each child identify a number of objects less than one metre and a number of items longer than one metre to provide referents for one metre.

## ACTIVITIES

- Make a chart of things in the classroom less than a metre, more than a metre, and about a metre in length. Record on a chart.

Example

| Less than a metre | More than a metre | About a metre |
|-------------------|-------------------|---------------|
|                   |                   |               |



## OBJECTIVE

To subtract a one-digit number from a two-digit number with regrouping

## PACING

Level A All  
Level B All  
Level C All

## MATERIALS

place-value charts, cardboard tens and ones, abacus

## RELATED AIDS

HMS—DM10.  
BFA COMP LAB I—55, 56.

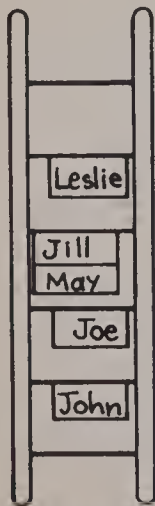
## SUGGESTIONS

**Initial Activity** Give the children 2 tens and 5 ones. Say, "Take 7 away. ... Trade 1 ten for 10 ones. Now what do you have? ... Can you take 7 away now? Record your work like this." (Use the place-value chart as in the display.)

Repeat for: 
$$\begin{array}{r} 32 \\ - 9 \\ \hline \end{array}$$
 
$$\begin{array}{r} 23 \\ - 6 \\ \hline \end{array}$$

## ACTIVITIES

1. Make up, or have the children help you make up, 30 word problem cards similar to those in Exercises 22 and 23. (Answers are to be recorded on the back of each.) Draw a large ladder on paper for the bulletin board. As a child does a question, he moves the card with his name on it up one more rung.



2. Use the abacus from Activity 2, page 15. Do each question on the abacus. Remember to regroup where necessary.

$$\begin{array}{r} 12 \\ - 7 \\ \hline \end{array}$$
 
$$\begin{array}{r} 23 \\ - 9 \\ \hline \end{array}$$
 
$$\begin{array}{r} 26 \\ - 9 \\ \hline \end{array}$$
 
$$\begin{array}{r} 33 \\ - 8 \\ \hline \end{array}$$
 
$$\begin{array}{r} 40 \\ - 9 \\ \hline \end{array}$$

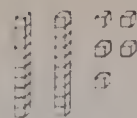
3. Use cardboard tens and ones (or the abacus) to do each.

$$\begin{array}{r} 22 \\ - 19 \\ \hline \end{array}$$
 
$$\begin{array}{r} 30 \\ - 18 \\ \hline \end{array}$$
 
$$\begin{array}{r} 36 \\ - 29 \\ \hline \end{array}$$
 
$$\begin{array}{r} 43 \\ - 28 \\ \hline \end{array}$$
 
$$\begin{array}{r} 54 \\ - 49 \\ \hline \end{array}$$

## Regrouping to Subtract

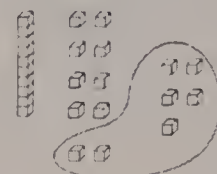
Subtract  $25 - 7$ .

Sometimes you have to do something special before you can subtract.



Subtract 7 blocks.

First you must break 1 ten into 10 ones and then subtract.



| tens | ones |
|------|------|
| 2    | 5    |
|      | 7    |
|      | 8    |

You have 5 ones.

Can you subtract 7 ones?

Regroup 1 ten  $\longrightarrow$  10 ones.

10 ones + 5 ones = 15 ones.

$15 - 7 = 8$  ones.

| tens | ones |
|------|------|
| 1    | 15   |
| 2    | 5    |
|      | 7    |
| 1    | 8    |

So,  $25 - 7 = 18$ .

This is what you did.

$$\begin{array}{r} 25 \\ - 7 \\ \hline 18 \end{array}$$

If you do not have enough ones to subtract, regroup and move 1 ten to the one's place.

60 Subtraction: 1 digit from 2 digits

**Using the Book** Ask the children how they would show 25. Direct them to show 25 using tens (longs) and ones. Ask, "Can you take 7 away?" Then proceed to get them to regroup, and then take 7 away.

Provide the class with a page of place-value charts so they can do the first set of questions exactly as shown in the text. (DM10)

## EXTRA PRACTICE

Subtract.

- $$\begin{array}{r} 45 \\ - 7 \\ \hline \end{array}$$
- $$\begin{array}{r} 37 \\ - 8 \\ \hline \end{array}$$
- $$\begin{array}{r} 58 \\ - 9 \\ \hline \end{array}$$
- $$\begin{array}{r} 81 \\ - 9 \\ \hline \end{array}$$
- $$\begin{array}{r} 32 \\ - 6 \\ \hline \end{array}$$
- $$\begin{array}{r} 28 \\ - 9 \\ \hline \end{array}$$
- $$\begin{array}{r} 51 \\ - 5 \\ \hline \end{array}$$
- $$\begin{array}{r} 77 \\ - 8 \\ \hline \end{array}$$

$$\begin{array}{r} 44 \\ - 7 \\ \hline \end{array}$$

$$\begin{array}{r} 18 \\ - 9 \\ \hline \end{array}$$

$$\begin{array}{r} 24 \\ - 7 \\ \hline \end{array}$$

$$\begin{array}{r} 43 \\ - 4 \\ \hline \end{array}$$

$$\begin{array}{r} 56 \\ - 8 \\ \hline \end{array}$$

$$\begin{array}{r} 34 \\ - 5 \\ \hline \end{array}$$

$$\begin{array}{r} 21 \\ - 8 \\ \hline \end{array}$$

$$\begin{array}{r} 45 \\ - 6 \\ \hline \end{array}$$

$$\begin{array}{r} 58 \\ - 9 \\ \hline \end{array}$$

$$\begin{array}{r} 83 \\ - 6 \\ \hline \end{array}$$

$$\begin{array}{r} 17 \\ - 8 \\ \hline \end{array}$$

$$\begin{array}{r} 33 \\ - 8 \\ \hline \end{array}$$

# Practice

| tens | ones |
|------|------|
| 2    | 15   |
| 3    | 5    |
| 0    | 8    |
| 2    | 7    |

$$\begin{array}{r} 35 \\ - 8 \\ \hline 27 \end{array}$$

3 tens and 5 ones  
0 tens and 8 ones

Subtract:

Put answer here.

- |   |   |   |   |   |
|---|---|---|---|---|
| 1. $\begin{array}{r} 34 \\ - 6 \\ \hline 28 \end{array}$  | 2. $\begin{array}{r} 42 \\ - 7 \\ \hline 35 \end{array}$  | 3. $\begin{array}{r} 65 \\ - 8 \\ \hline 57 \end{array}$  | 4. $\begin{array}{r} 21 \\ - 3 \\ \hline 18 \end{array}$  | 5. $\begin{array}{r} 46 \\ - 9 \\ \hline 37 \end{array}$  |
| 7. $\begin{array}{r} 23 \\ - 7 \\ \hline 16 \end{array}$  | 8. $\begin{array}{r} 34 \\ - 8 \\ \hline 26 \end{array}$  | 9. $\begin{array}{r} 57 \\ - 9 \\ \hline 48 \end{array}$  | 10. $\begin{array}{r} 10 \\ - 4 \\ \hline 6 \end{array}$  | 11. $\begin{array}{r} 80 \\ - 6 \\ \hline 74 \end{array}$ |
| 12. $\begin{array}{r} 64 \\ - 6 \\ \hline 58 \end{array}$ | 13. $\begin{array}{r} 84 \\ - 7 \\ \hline 77 \end{array}$ | 14. $\begin{array}{r} 41 \\ - 5 \\ \hline 36 \end{array}$ | 15. $\begin{array}{r} 64 \\ - 2 \\ \hline 62 \end{array}$ | 16. $\begin{array}{r} 36 \\ - 9 \\ \hline 27 \end{array}$ |
| 17. $\begin{array}{r} 54 \\ - 8 \\ \hline 46 \end{array}$ | 18. $\begin{array}{r} 16 \\ - 5 \\ \hline 11 \end{array}$ | 19. $\begin{array}{r} 46 \\ - 8 \\ \hline 38 \end{array}$ | 20. $\begin{array}{r} 56 \\ - 9 \\ \hline 47 \end{array}$ | 21. $\begin{array}{r} 43 \\ - 6 \\ \hline 37 \end{array}$ |

22. Raj has 43 stamps.  
He pasted 9 into his stamp book.  
How many more does he have to put in his book? **34**

23. Jan has 21 cards.  
She gave 6 to Henri.  
How many does she have left? **15**

## OBJECTIVE

To subtract two-digit numbers with regrouping

## PACING

Level A 1-5  
Level B All  
Level C 3-6

## MATERIALS

sticks, elastics, place-value charts, abacus

## RELATED AIDS

HMS—DM10.  
BFA COMP LAB I—57.

## SUGGESTIONS

**Initial Activity** Remind the children that when we add we move the extra ten to the ten's column. When we regroup in subtraction, we move the ten from the ten's column to the one's column.

## ACTIVITIES

1. Use the abacus (or cardboard tens and units) to do each.

$$\begin{array}{r} 23 \\ -13 \\ \hline \end{array} \quad \begin{array}{r} 46 \\ -36 \\ \hline \end{array} \quad \begin{array}{r} 52 \\ -52 \\ \hline \end{array} \quad \begin{array}{r} 37 \\ -29 \\ \hline \end{array} \quad \begin{array}{r} 54 \\ -37 \\ \hline \end{array}$$

2. Make up a set of cards labelled "subtract". Make a ladder and post it as indicated in Activity 1 for pages 60 and 61. Each child places his card on the ladder indicating the number of questions he has done.

3. Provide a set of subtraction puzzles such as:

|     |     |      |      |     |      |      |      |      |
|-----|-----|------|------|-----|------|------|------|------|
| 23  | 9   | (14) | 35   | 19  | (16) | 69   | 37   | (32) |
| 17  | 8   | (9)  | 16   | 10  | (9)  | 39   | 20   | (19) |
| (6) | (1) | (5)  | (19) | (9) | (10) | (30) | (17) | (13) |

Answers are given in brackets.

## EXTRA PRACTICE

Subtract.

- |  |  |  |  |
|--|--|--|--|
| 1. $\begin{array}{r} 84 \\ -47 \\ \hline \end{array}$  | 2. $\begin{array}{r} 21 \\ -12 \\ \hline \end{array}$  |  |  |
| 3. $\begin{array}{r} 54 \\ -28 \\ \hline \end{array}$  | 4. $\begin{array}{r} 62 \\ -19 \\ \hline \end{array}$  |  |  |
| 5. $\begin{array}{r} 41 \\ -29 \\ \hline \end{array}$  | 6. $\begin{array}{r} 36 \\ -17 \\ \hline \end{array}$  | 13. $\begin{array}{r} 79 \\ -54 \\ \hline \end{array}$ | 14. $\begin{array}{r} 81 \\ -15 \\ \hline \end{array}$ |
| 7. $\begin{array}{r} 87 \\ -43 \\ \hline \end{array}$  | 8. $\begin{array}{r} 95 \\ -57 \\ \hline \end{array}$  | 15. $\begin{array}{r} 52 \\ -38 \\ \hline \end{array}$ | 16. $\begin{array}{r} 97 \\ -29 \\ \hline \end{array}$ |
| 9. $\begin{array}{r} 66 \\ -47 \\ \hline \end{array}$  | 10. $\begin{array}{r} 35 \\ -17 \\ \hline \end{array}$ | 17. $\begin{array}{r} 44 \\ -19 \\ \hline \end{array}$ | 18. $\begin{array}{r} 37 \\ -15 \\ \hline \end{array}$ |
| 11. $\begin{array}{r} 42 \\ -27 \\ \hline \end{array}$ | 12. $\begin{array}{r} 56 \\ -39 \\ \hline \end{array}$ | 19. $\begin{array}{r} 63 \\ -27 \\ \hline \end{array}$ | 20. $\begin{array}{r} 45 \\ -19 \\ \hline \end{array}$ |

## More Regrouping

Subtract  $53 - 17$ .

| tens | ones |
|------|------|
| 5    | 3    |
| 1    | 7    |
|      | 6    |

You have 3 ones.

Can you subtract 7 ones?

Regroup 1 ten  $\rightarrow$  10 ones.

$10 \text{ ones} + 3 \text{ ones} = 13 \text{ ones.}$

$13 - 7 = 6 \text{ ones.}$

| tens | ones |
|------|------|
| 5    | 3    |
| 1    | 7    |
| 3    | 6    |

Now subtract in the ten's place.

$4 - 1 = 3.$

So  $53 - 17 = 36.$

If you do not have enough ones to subtract, regroup and move a ten to the one's place.

1. Copy and complete.

54

-36

18

5 tens + <sup>4</sup> ones

3 tens + <sup>6</sup> ones

Subtract:

| tens | ones |
|------|------|
| 5    | 4    |
| 3    | 6    |
| 1    | 8    |

2. Tell how you would get these answers.

$$\begin{array}{r} \text{(a)} \quad 61 \\ -45 \\ \hline 16 \end{array}$$

$$\begin{array}{r} \text{(b)} \quad 42 \\ -27 \\ \hline 15 \end{array}$$

$$\begin{array}{r} \text{(c)} \quad 83 \\ -36 \\ \hline 47 \end{array}$$

$$\begin{array}{r} \text{(d)} \quad 64 \\ -37 \\ \hline 27 \end{array}$$

62 Subtracting 2-digit numbers, regrouping

**Using the Book** Write  $\begin{array}{r} 53 \\ -17 \\ \hline \end{array}$  on the chalkboard. Direct the child to put out 53 using longs and ones (or abacus). Ask, "Can you take 7 ones away? Explain." "What shall we do? (Elicit the answer: regroup 1 ten to 10 ones.)" "How many ones do we have now?" "Now take 7 away. How many are left?" Continue in this way until the question is complete. Develop a flow chart to illustrate the process involved. Then direct the children to the display and ask them to explain what is shown there.

Direct the children to copy the place-value chart in Exercise 1 and complete it.

Do Exercise 2 orally.

Assign page 63. You may wish to assign this over two different days: a to e of each exercise one day and f to j the second day.



|    |     |   |   |     |   |     |   |     |   |     |   |
|----|-----|---|---|-----|---|-----|---|-----|---|-----|---|
| 3. | (a) | $\begin{array}{r} 48 \\ -19 \\ \hline \end{array}$    | $\begin{array}{r} 48 \\ -19 \\ \hline 29 \end{array}$ | (b) | $\begin{array}{r} 63 \\ -24 \\ \hline 39 \end{array}$ | (c) | $\begin{array}{r} 95 \\ -37 \\ \hline 58 \end{array}$ | (d) | $\begin{array}{r} 74 \\ -55 \\ \hline 19 \end{array}$ | (e) | $\begin{array}{r} 87 \\ -29 \\ \hline 58 \end{array}$ |
|    | (f) | $\begin{array}{r} 32 \\ -13 \\ \hline 19 \end{array}$ |   | (g) | $\begin{array}{r} 55 \\ -23 \\ \hline 32 \end{array}$ | (h) | $\begin{array}{r} 94 \\ -48 \\ \hline 46 \end{array}$ | (i) | $\begin{array}{r} 34 \\ -18 \\ \hline 16 \end{array}$ | (j) | $\begin{array}{r} 87 \\ -49 \\ \hline 38 \end{array}$ |
| 4. | (a) | $\begin{array}{r} 61 \\ -27 \\ \hline 34 \end{array}$ |   | (b) | $\begin{array}{r} 74 \\ -46 \\ \hline 28 \end{array}$ | (c) | $\begin{array}{r} 51 \\ -34 \\ \hline 17 \end{array}$ | (d) | $\begin{array}{r} 92 \\ -63 \\ \hline 29 \end{array}$ | (e) | $\begin{array}{r} 76 \\ -43 \\ \hline 33 \end{array}$ |
|    | (f) | $\begin{array}{r} 62 \\ -35 \\ \hline 27 \end{array}$ |   | (g) | $\begin{array}{r} 95 \\ -48 \\ \hline 47 \end{array}$ | (h) | $\begin{array}{r} 74 \\ -29 \\ \hline 45 \end{array}$ | (i) | $\begin{array}{r} 82 \\ -37 \\ \hline 45 \end{array}$ | (j) | $\begin{array}{r} 44 \\ -27 \\ \hline 17 \end{array}$ |
| 5. | (a) | $\begin{array}{r} 87 \\ -36 \\ \hline 51 \end{array}$ |   | (b) | $\begin{array}{r} 66 \\ -33 \\ \hline 33 \end{array}$ | (c) | $\begin{array}{r} 99 \\ -29 \\ \hline 70 \end{array}$ | (d) | $\begin{array}{r} 82 \\ -68 \\ \hline 14 \end{array}$ | (e) | $\begin{array}{r} 71 \\ -35 \\ \hline 36 \end{array}$ |
|    | (f) | $\begin{array}{r} 54 \\ -27 \\ \hline 27 \end{array}$ |   | (g) | $\begin{array}{r} 72 \\ -32 \\ \hline 40 \end{array}$ | (h) | $\begin{array}{r} 36 \\ -17 \\ \hline 19 \end{array}$ | (i) | $\begin{array}{r} 41 \\ -28 \\ \hline 13 \end{array}$ | (j) | $\begin{array}{r} 53 \\ -37 \\ \hline 16 \end{array}$ |
| 6. | (a) | $\begin{array}{r} 34 \\ -18 \\ \hline 16 \end{array}$ |   | (b) | $\begin{array}{r} 47 \\ -29 \\ \hline 18 \end{array}$ | (c) | $\begin{array}{r} 82 \\ -46 \\ \hline 36 \end{array}$ | (d) | $\begin{array}{r} 63 \\ -35 \\ \hline 28 \end{array}$ | (e) | $\begin{array}{r} 85 \\ -65 \\ \hline 20 \end{array}$ |
|    | (f) | $\begin{array}{r} 58 \\ -28 \\ \hline 30 \end{array}$ |   | (g) | $\begin{array}{r} 35 \\ -19 \\ \hline 16 \end{array}$ | (h) | $\begin{array}{r} 62 \\ -40 \\ \hline 22 \end{array}$ | (i) | $\begin{array}{r} 41 \\ -15 \\ \hline 26 \end{array}$ | (j) | $\begin{array}{r} 94 \\ -56 \\ \hline 38 \end{array}$ |

## OBJECTIVE

To solve problems in addition and subtraction involving regrouping

## PACING

Level A All  
Level B All  
Level C All

## VOCABULARY

cupcakes, disappeared

## MATERIALS

variety of concrete materials, overhead projector

## SUGGESTIONS

**Initial Activity** Review the regrouping process using concrete materials and then pictures (or drawings) on the overhead projector or on a chart.

## ACTIVITIES

1. Make a poster to advertise items for sale in the bakery and prices of the items.

2. Make up a list of food from a bakery and have the children make up shopping lists. Further problems can be derived from these lists.

3. This career topic could be augmented if a trip to a local bakery could be arranged.

See notes on the Bake Shop in the Chapter Overview for additional ideas.

4. Ask each child in the group to prepare, with the answer, a question that a baker might have that can be solved using addition or subtraction. You may wish to provide children with the raw numbers or facts for use in the problem. (See page 57, Activities 2 and 3).

## Baker



48 cupcakes in the window.  
56 cookies in the window.  
How many altogether?

$$\begin{array}{r} 48 \\ + 56 \\ \hline 104 \end{array}$$

Write the number story.

Solve the mysteries.

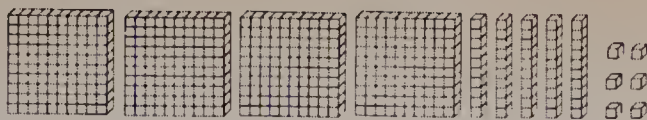
- |   |   |
|---|---|
| 1. 18 cakes.<br>27 pies appeared.<br>How many now? <b>45</b>                    | 2. 14 berry pies.<br>13 cream pies appeared.<br>How many now? <b>27</b>             |
| 3. 18 cakes altogether.<br>9 cakes disappeared.<br>How many cakes now? <b>9</b> | 4. 56 chocolate chip cookies.<br>18 cookies disappeared.<br>How many now? <b>38</b> |
| 5. 36 nut squares.<br>19 plain squares appeared.<br>How many now? <b>55</b>     | 6. 25 buns.<br>17 buns disappeared.<br>How many buns now? <b>8</b>                  |

64 Problem solving

**Using the Book** Tell the children that often there are key words in problems that tell whether to add or subtract. Ask what the two key words are in the problems on this page. Then discuss “disappear” meaning to take away — to subtract, and “appear” meaning to add to the group.

# Subtracting in the Hundreds

Subtract  $456 - 124$ .



First, subtract in the one's place.  
 $6 - 4 = 2$ .

| hundreds | tens | ones |
|----------|------|------|
| 4        | 5    | 6    |
| 1        | 2    | 4    |
|          |      | 2    |

Next, subtract in the ten's place.  
 $5 - 2 = 3$ .

| hundreds | tens | ones |
|----------|------|------|
| 4        | 5    | 6    |
| 1        | 2    | 4    |
|          | 3    | 2    |

Now, subtract in the hundred's place.  
 $4 - 1 = 3$ .

| hundreds | tens | ones |
|----------|------|------|
| 4        | 5    | 6    |
| 1        | 2    | 4    |
| 3        | 3    | 2    |

This is what you did.

$$\begin{array}{r} 456 \\ - 124 \\ \hline 332 \end{array}$$

Subtracting 3-digit numbers 65

**Using the Book** Refer to page 65. Discuss with the class what is illustrated here. Elicit from the children their explanations. (This is the bridge between the concrete flats, longs, and ones and the abstract number exercises.) If necessary, illustrate using the cardboard flats, longs, and ones.

Proceed directly to page 66 when you feel the children are ready to do the subtraction without the cardboard cutouts.

2. Subtract.  
4 hundreds 7 tens 0 ones  
2 hundreds 4 tens 0 ones

3. Subtract.  
3 hundreds 6 tens 5 ones  
1 ten 5 ones

4. Subtract.  
4 hundreds 1 ten 4 ones  
2 hundreds 0 tens 8 ones

5. Subtract.  
4 hundreds 6 tens 2 ones  
1 hundred 9 tens 8 ones

$$\begin{array}{r} 3. \quad 789 \\ - 647 \\ \hline \end{array}$$

$$\begin{array}{r} 4. \quad 264 \\ - 133 \\ \hline \end{array}$$

$$\begin{array}{r} 5. \quad 670 \\ - 250 \\ \hline \end{array}$$

$$\begin{array}{r} 6. \quad 786 \\ - 644 \\ \hline \end{array}$$

$$\begin{array}{r} 7. \quad 497 \\ - 316 \\ \hline \end{array}$$

$$\begin{array}{r} 8. \quad 985 \\ - 885 \\ \hline \end{array}$$

$$\begin{array}{r} 9. \quad 659 \\ - 437 \\ \hline \end{array}$$

$$\begin{array}{r} 10. \quad 328 \\ - 113 \\ \hline \end{array}$$

$$\begin{array}{r} 11. \quad 282 \\ - 131 \\ \hline \end{array}$$

$$\begin{array}{r} 12. \quad 639 \\ - 219 \\ \hline \end{array}$$

$$\begin{array}{r} 13. \quad 783 \\ - 141 \\ \hline \end{array}$$

$$\begin{array}{r} 14. \quad 558 \\ - 447 \\ \hline \end{array}$$

$$\begin{array}{r} 15. \quad 688 \\ - 355 \\ \hline \end{array}$$

$$\begin{array}{r} 16. \quad 376 \\ - 125 \\ \hline \end{array}$$

$$\begin{array}{r} 17. \quad 581 \\ - 480 \\ \hline \end{array}$$

$$\begin{array}{r} 18. \quad 875 \\ - 350 \\ \hline \end{array}$$

$$\begin{array}{r} 19. \quad 320 \\ - 120 \\ \hline \end{array}$$

$$\begin{array}{r} 20. \quad 297 \\ - 135 \\ \hline \end{array}$$

## EXTRA PRACTICE

Subtract.

$$\begin{array}{r} 1. \quad 247 \\ - 132 \\ \hline \end{array}$$

$$\begin{array}{r} 2. \quad 565 \\ - 241 \\ \hline \end{array}$$

## OBJECTIVE

To subtract three-digit numbers without regrouping

## PACING

Level A All  
Level B All  
Level C 2-4

## MATERIALS

place-value charts, coloured transparent sheet with window cut out to show three numbers vertically (page 46)

## RELATED AIDS

BFA COMP LAB I—54, 66, 67.

## SUGGESTIONS

**Initial Activity** Give the children 4 hundreds, 5 tens, and 6 ones. Say, "Take 4 ones away. Now take 2 tens away. Now take 1 hundred away. What do you have left?" Show this using the place-value chart or coloured transparent sheet with window cut out. Repeat for:

$$\begin{array}{r} 496 \\ - 265 \\ \hline \end{array}$$

$$\begin{array}{r} 358 \\ - 156 \\ \hline \end{array}$$

Ask the child to record his work on a place-value chart.

## ACTIVITIES

1. Challenge the child to use the digits 1, 2, 3, 4, 5, 6 in different ways so that each difference is 111.

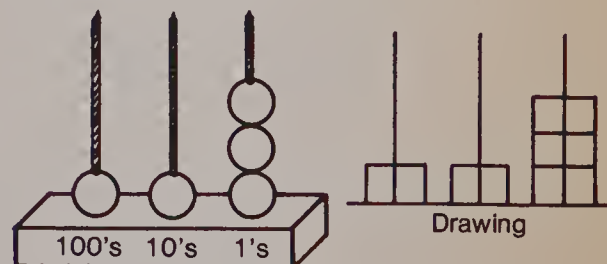
$$\begin{array}{r} \blacksquare\blacksquare 4 \\ - \blacksquare\blacksquare 3 \\ \hline 111 \end{array}$$

$$\begin{array}{r} \blacksquare\blacksquare\blacksquare \\ - \blacksquare\blacksquare\blacksquare \\ \hline 111 \end{array}$$

$$\begin{array}{r} \blacksquare\blacksquare\blacksquare \\ - \blacksquare\blacksquare\blacksquare \\ \hline 111 \end{array}$$

2. Make an abacus to show each of these numbers. Draw diagrams to record your answers.

650 165 74 375 401 502



3. Make up these 5 challenge cards numbered as shown. (Question 5 is the hardest. Questions 4 and 5 involve regrouping.)

1. Subtract.  
3 hundreds 5 tens 2 ones  
1 hundred 2 tens 1 one



# Practice

1. Copy and complete.

$$\begin{array}{r} 468 \\ -237 \\ \hline 231 \end{array}$$

| hundreds | tens | ones |
|----------|------|------|
| 4        | 6    | 8    |
| 2        | 3    | 7    |
| 2        | 3    | 1    |

$$\begin{array}{r} 687 \\ -356 \\ \hline 331 \end{array}$$

| hundreds | tens | ones |
|----------|------|------|
| 6        | 8    | 7    |
| 3        | 5    | 6    |
| 3        | 3    | 1    |

2. (a)  $\begin{array}{r} 467 \\ -115 \\ \hline 352 \end{array}$

(b)  $\begin{array}{r} 846 \\ -212 \\ \hline 634 \end{array}$

(c)  $\begin{array}{r} 428 \\ -217 \\ \hline 211 \end{array}$

(d)  $\begin{array}{r} 277 \\ -124 \\ \hline 153 \end{array}$

(e)  $\begin{array}{r} 626 \\ -114 \\ \hline 512 \end{array}$

(f)  $\begin{array}{r} 947 \\ -234 \\ \hline 713 \end{array}$

(g)  $\begin{array}{r} 368 \\ -124 \\ \hline 244 \end{array}$

(h)  $\begin{array}{r} 687 \\ -325 \\ \hline 362 \end{array}$

(i)  $\begin{array}{r} 845 \\ -613 \\ \hline 232 \end{array}$

(j)  $\begin{array}{r} 247 \\ -123 \\ \hline 124 \end{array}$

3. (a)  $\begin{array}{r} 649 \\ -143 \\ \hline 506 \end{array}$

(b)  $\begin{array}{r} 478 \\ -235 \\ \hline 243 \end{array}$

(c)  $\begin{array}{r} 628 \\ -413 \\ \hline 215 \end{array}$

(d)  $\begin{array}{r} 557 \\ -132 \\ \hline 425 \end{array}$

(e)  $\begin{array}{r} 948 \\ -315 \\ \hline 633 \end{array}$

(f)  $\begin{array}{r} 402 \\ -101 \\ \hline 301 \end{array}$

(g)  $\begin{array}{r} 720 \\ -510 \\ \hline 210 \end{array}$

(h)  $\begin{array}{r} 564 \\ -532 \\ \hline 32 \end{array}$

(i)  $\begin{array}{r} 653 \\ -412 \\ \hline 241 \end{array}$

(j)  $\begin{array}{r} 849 \\ -237 \\ \hline 612 \end{array}$

4. (a)  $\begin{array}{r} 968 \\ -635 \\ \hline 333 \end{array}$

(b)  $\begin{array}{r} 464 \\ -262 \\ \hline 202 \end{array}$

(c)  $\begin{array}{r} 837 \\ -421 \\ \hline 416 \end{array}$

(d)  $\begin{array}{r} 536 \\ -315 \\ \hline 221 \end{array}$

(e)  $\begin{array}{r} 351 \\ -211 \\ \hline 140 \end{array}$

(f)  $\begin{array}{r} 643 \\ -320 \\ \hline 323 \end{array}$

(g)  $\begin{array}{r} 486 \\ -243 \\ \hline 243 \end{array}$

(h)  $\begin{array}{r} 727 \\ -427 \\ \hline 300 \end{array}$

(i)  $\begin{array}{r} 463 \\ -231 \\ \hline 232 \end{array}$

(j)  $\begin{array}{r} 745 \\ -531 \\ \hline 214 \end{array}$

# Regrouping Hundreds

Subtract 425 - 153.

| h | t | o |
|---|---|---|
| 4 | 2 | 5 |
| 1 | 5 | 3 |

| h | t | o |
|---|---|---|
| 4 | 2 | 5 |
| 1 | 5 | 3 |
| 2 | 7 | 2 |

You have 2 tens. Can you subtract 5 tens?  
No! You need more tens.  
So, regroup 1 hundred as 10 tens.  
Now you have 12 tens.  
Can you subtract 5 tens?

Copy and complete.

1. 316      3 hundreds 1 ten 6 ones  
-143      1 hundred 4 tens 3 ones

173

2. 528      5 hundreds 2 tens 8 ones  
-264      2 hundreds 6 tens 4 ones

264

3. 843      8 hundreds 4 tens 3 ones  
-372      3 hundreds 7 tens 2 ones

471

4. 935      9 hundreds 3 tens 5 ones  
-562      5 hundreds 6 tens 2 ones

373

Subtract:

| h | t | o |
|---|---|---|
| 3 | 1 | 6 |
| 1 | 4 | 3 |

| h | t | o |
|---|---|---|
| 2 | 7 | 3 |
| 1 | 4 | 3 |

| h | t | o |
|---|---|---|
| 2 | 6 | 4 |
| 1 | 4 | 3 |

| h | t | o |
|---|---|---|
| 2 | 7 | 3 |
| 1 | 4 | 3 |

Subtracting 3-digit numbers, regrouping 67

**Using the Book** Direct the children to the display on page 67. Discuss what is done in the display. Emphasize 1 hundred is regrouped as 10 tens therefore we have 12 tens.

Do Exercises 1, 2, 3, and 4 on page 67 orally, using the window sheet on the overhead projector or by directing the children to follow in their books. Alternately, have the children take turns at the chalkboard doing the various steps. Discuss.

You may wish to assign page 68 in two parts.

11. 481      12. 576  
- 34      - 47

13. 677      14. 536  
- 248      - 119

15. 527      16. 619  
- 42      - 63

17. 934      18. 327  
- 671      - 186

19. 487      20. 564  
- 294      - 183

3. 367      4. 498  
- 24      - 53

5. 647      6. 388  
- 26      - 72

7. 986      8. 266  
- 53      - 133

9. 557      10. 479  
- 437      - 248

## OBJECTIVE

To find the difference when subtracting three-digit numbers with regrouping

## PACING

Level A 68 1-6

Level B 68 2-7

Level C 68 3-7

## VOCABULARY

regrouping

## MATERIALS

graph paper, place-value charts, window sheet

## RELATED AIDS

BFA COMP LAB I—52, 53, 58-60, 68.

## SUGGESTIONS

**Initial Activity** Review previous work on subtracting with regrouping (pages 60 and 62).

## ACTIVITIES

1. Let the children play the "Shuffle Numbers" game as described in the Activity Reservoir.

2. Provide the child with a set of problems like this for completion. Answers may vary.

|                |               |              |
|----------------|---------------|--------------|
| 7 ■■<br>- 243  | ■ 64<br>- ■■■ | ■■■<br>- 45■ |
| ■■ 5           | 3 ■ 2         | ■ 23         |
| ■ 3 ■<br>- ■ 5 | ■■■<br>- ■    | 792<br>- ■■  |
| ■■ 4           | 23■           | ■ 00         |

These are tougher!

|               |              |
|---------------|--------------|
| 683<br>- ■■■  | 546<br>- 2■■ |
| ■ 47          | ■ 62         |
| 703<br>- ■■ 1 | 408<br>- ■■■ |
| 24■           | 111          |

3. Ask the children to write a mini-problem of each type below using three-digit numbers. Put answers on back of each problem card. Challenge a classmate to solve the problems.

(a) How many more?

(b) How many fewer?

(c) How many are left?

## EXTRA PRACTICE

Subtract.

|               |               |
|---------------|---------------|
| 1. 175<br>- 3 | 2. 679<br>- 8 |
|---------------|---------------|

# Practice

Subtract.

$$\begin{array}{r} 1. \text{ (a) } 528 \\ - 2 \\ \hline 526 \end{array}$$

$$\begin{array}{r} \text{ (b) } 375 \\ - 4 \\ \hline 371 \end{array}$$

$$\begin{array}{r} \text{ (c) } 286 \\ - 2 \\ \hline 284 \end{array}$$

$$\begin{array}{r} \text{ (d) } 368 \\ - 3 \\ \hline 365 \end{array}$$

$$\begin{array}{r} \text{ (e) } 258 \\ - 7 \\ \hline 251 \end{array}$$

$$\begin{array}{r} 2. \text{ (a) } 387 \\ - 54 \\ \hline 333 \end{array}$$

$$\begin{array}{r} \text{ (b) } 679 \\ - 26 \\ \hline 653 \end{array}$$

$$\begin{array}{r} \text{ (c) } 229 \\ - 19 \\ \hline 210 \end{array}$$

$$\begin{array}{r} \text{ (d) } 547 \\ - 23 \\ \hline 524 \end{array}$$

$$\begin{array}{r} \text{ (e) } 867 \\ - 34 \\ \hline 833 \end{array}$$

$$\begin{array}{r} 3. \text{ (a) } 459 \\ - 26 \\ \hline 433 \end{array}$$

$$\begin{array}{r} \text{ (b) } 288 \\ - 45 \\ \hline 243 \end{array}$$

$$\begin{array}{r} \text{ (c) } 896 \\ - 60 \\ \hline 836 \end{array}$$

$$\begin{array}{r} \text{ (d) } 737 \\ - 14 \\ \hline 723 \end{array}$$

$$\begin{array}{r} \text{ (e) } 659 \\ - 24 \\ \hline 635 \end{array}$$

$$\begin{array}{r} 4. \text{ (a) } 458 \\ - 123 \\ \hline 335 \end{array}$$

$$\begin{array}{r} \text{ (b) } 765 \\ - 443 \\ \hline 322 \end{array}$$

$$\begin{array}{r} \text{ (c) } 653 \\ - 312 \\ \hline 341 \end{array}$$

$$\begin{array}{r} \text{ (d) } 568 \\ - 235 \\ \hline 333 \end{array}$$

$$\begin{array}{r} \text{ (e) } 479 \\ - 324 \\ \hline 155 \end{array}$$

Watch these!

$$\begin{array}{r} 5. \text{ (a) } 442 \\ - 25 \\ \hline 417 \end{array}$$

$$\begin{array}{r} \text{ (b) } 651 \\ - 32 \\ \hline 619 \end{array}$$

$$\begin{array}{r} \text{ (c) } 284 \\ - 46 \\ \hline 238 \end{array}$$

$$\begin{array}{r} \text{ (d) } 162 \\ - 33 \\ \hline 129 \end{array}$$

$$\begin{array}{r} \text{ (e) } 541 \\ - 26 \\ \hline 515 \end{array}$$

$$\begin{array}{r} 6. \text{ (a) } 957 \\ - 63 \\ \hline 894 \end{array}$$

$$\begin{array}{r} \text{ (b) } 425 \\ - 42 \\ \hline 383 \end{array}$$

$$\begin{array}{r} \text{ (c) } 638 \\ - 55 \\ \hline 583 \end{array}$$

$$\begin{array}{r} \text{ (d) } 237 \\ - 42 \\ \hline 195 \end{array}$$

$$\begin{array}{r} \text{ (e) } 549 \\ - 64 \\ \hline 485 \end{array}$$

$$\begin{array}{r} 7. \text{ (a) } 923 \\ - 241 \\ \hline 682 \end{array}$$

$$\begin{array}{r} \text{ (b) } 345 \\ - 172 \\ \hline 173 \end{array}$$

$$\begin{array}{r} \text{ (c) } 566 \\ - 384 \\ \hline 182 \end{array}$$

$$\begin{array}{r} \text{ (d) } 928 \\ - 453 \\ \hline 475 \end{array}$$

$$\begin{array}{r} \text{ (e) } 437 \\ - 255 \\ \hline 182 \end{array}$$





## How Tall Is Tall?

1. Use a height chart to find your height in centimetres.
2. How tall is the tallest person in your class?  
How tall is your teacher?
3. The tallest man was 272 cm.  
The tallest woman was 241 cm.  
How much taller was the man? **31 cm**
4. The shortest man was 67 cm.  
The shortest woman was 59 cm.  
How much taller was the man? **8 cm**

5. The tallest people are the Tutsi of Africa.  
A Tutsi is about 185 cm tall.  
A Canadian is about 170 cm.  
How much taller is the Tutsi? **15 cm**
6. The shortest pygmies are the Mbuti in Africa.  
A pygmy man is about 132 cm.  
A woman is about 124 cm.  
How much taller is the man? **8 cm**
7. The most famous midget was Tom Thumb.  
He was 102 cm.  
How much taller than the shortest man was he? **35 cm**

Measurement, problem-solving practice 69

**Using the Book** If some members of the class need assistance to read this page, use this as an opportunity to develop reading skills. You may wish to read all exercises aloud, or have children take turns reading the exercises aloud, or you may have the children read silently and answer aloud questions you ask about each exercise.

## OBJECTIVES

To provide relevant measurement experiences

To provide practice in problem solving using subtraction with or without regrouping

## PACING

Level A 1-6

Level B 1-6

Level C All

## VOCABULARY

height, Tutsi, Africa, pygmies, famous, midget

## MATERIALS

height chart marked in centimetres and attached to a wall

## SUGGESTIONS

**Initial Activity** Have the children work in pairs to find and record their height in centimetres. Make a graph to record the height of everyone in the class. (Refer to earlier work on the centimetre on page 37.)

## ACTIVITIES

1. Have the children work in groups to show the data from this page on a wall bar graph.

*Example*

A group makes a strip of paper 272 cm long to represent the tallest man, and tapes it to the wall. Label. Another group does the tallest woman, etc.

2. Ask the children to list all the measurements in Exercises 3-7. They are to tell whether each is closest to 3 m, 2 m, 1 m, or half metre.

## OBJECTIVE

To subtract three-digit numbers with regrouping in two places

## PACING

Level A 71 1-6  
Level B 71 All  
Level C 71 All

## MATERIALS

cutouts of hundreds, tens, and ones;  
coloured transparent sheet with  
window cut out to show four numbers  
vertically and two digits horizontally;  
place-value charts

## SUGGESTIONS

**Initial Activity** Review subtraction of two-digit numbers with regrouping.

Do several sample questions with the children using concrete materials or pictures of objects (bundles).

Use the place-value chart for recording the process of regrouping. The use of the window sheet will allow for the isolation of the columns involved in regrouping during one part of solving the question.

## ACTIVITIES

1. Set up a group of puzzle cards which will require the children to fill in the expanded form of the question and then solve the question as indicated by Exercise 4 on page 70.

2. Let the children play the "Missing Numbers" game in the Activity Reservoir.

3. Use the abacus to solve these.

|       |       |       |      |       |
|-------|-------|-------|------|-------|
| 475   | 328   | 581   | 566  | 224   |
| - 308 | - 188 | - 177 | - 99 | - 137 |

## EXTRA PRACTICE

Subtract.

- |   |   |
|---|---|
| 1. $\begin{array}{r} 653 \\ - 437 \\ \hline \end{array}$  | 2. $\begin{array}{r} 588 \\ - 229 \\ \hline \end{array}$  |
| 3. $\begin{array}{r} 363 \\ - 147 \\ \hline \end{array}$  | 4. $\begin{array}{r} 825 \\ - 317 \\ \hline \end{array}$  |
| 5. $\begin{array}{r} 336 \\ - 157 \\ \hline \end{array}$  | 6. $\begin{array}{r} 741 \\ - 574 \\ \hline \end{array}$  |
| 7. $\begin{array}{r} 474 \\ - 285 \\ \hline \end{array}$  | 8. $\begin{array}{r} 523 \\ - 177 \\ \hline \end{array}$  |
| 9. $\begin{array}{r} 764 \\ - 389 \\ \hline \end{array}$  | 10. $\begin{array}{r} 682 \\ - 198 \\ \hline \end{array}$ |
| 11. $\begin{array}{r} 321 \\ - 144 \\ \hline \end{array}$ | 12. $\begin{array}{r} 511 \\ - 225 \\ \hline \end{array}$ |
| 13. $\begin{array}{r} 335 \\ - 177 \\ \hline \end{array}$ | 14. $\begin{array}{r} 866 \\ - 579 \\ \hline \end{array}$ |

## Regrouping to Subtract

Subtract  $947 - 358$ .

| h | t | o |
|---|---|---|
| 9 | 4 | 7 |
| 3 | 5 | 8 |
|   |   |   |

| h | t | o |
|---|---|---|
| 9 | 4 | 7 |
| 3 | 5 | 8 |
|   |   | 9 |

| h | t | o |
|---|---|---|
| 9 | 4 | 7 |
| 3 | 5 | 8 |
| 5 | 8 | 9 |

Copy and complete.

1.  $\begin{array}{r} 462 \\ - 174 \\ \hline \end{array}$       4 hundreds    <sup>6</sup> tens    <sup>2</sup> ones  
1 hundred    <sup>7</sup> tens    <sup>4</sup> ones  
Put answer here.

Subtract:

| h              | t              | o              |
|----------------|----------------|----------------|
| 4              | 6              | 2              |
| <sup>1</sup> 1 | <sup>7</sup> 7 | <sup>4</sup> 4 |
| <sup>2</sup> 2 | <sup>8</sup> 8 | <sup>8</sup> 8 |

2.  $\begin{array}{r} 523 \\ - 259 \\ \hline \end{array}$       <sup>5</sup> hundreds    <sup>2</sup> tens    <sup>3</sup> ones  
<sup>2</sup> hundreds    <sup>5</sup> tens    <sup>9</sup> ones

Subtract:

| h              | t               | o               |
|----------------|-----------------|-----------------|
| <sup>4</sup> 5 | <sup>11</sup> 2 | <sup>13</sup> 3 |
| <sup>2</sup> 2 | <sup>5</sup> 5  | <sup>9</sup> 9  |
| <sup>2</sup> 2 | <sup>6</sup> 6  | <sup>4</sup> 4  |

3.  $\begin{array}{r} 843 \\ - 285 \\ \hline \end{array}$       <sup>8</sup> hundreds    <sup>4</sup> tens    <sup>3</sup> ones  
<sup>2</sup> hundreds    <sup>8</sup> tens    <sup>5</sup> ones

Subtract:

| h              | t               | o               |
|----------------|-----------------|-----------------|
| <sup>7</sup> 8 | <sup>13</sup> 4 | <sup>13</sup> 3 |
| <sup>2</sup> 2 | <sup>8</sup> 8  | <sup>5</sup> 5  |
| <sup>6</sup> 6 | <sup>5</sup> 5  | <sup>8</sup> 8  |

4.  $\begin{array}{r} 432 \\ - 174 \\ \hline \end{array}$       <sup>4</sup> hundreds    <sup>3</sup> tens    <sup>2</sup> ones  
<sup>1</sup> hundred    <sup>7</sup> tens    <sup>4</sup> ones

Subtract:

| h              | t               | o               |
|----------------|-----------------|-----------------|
| <sup>3</sup> 4 | <sup>12</sup> 3 | <sup>12</sup> 2 |
| <sup>1</sup> 1 | <sup>7</sup> 7  | <sup>4</sup> 4  |
| <sup>2</sup> 2 | <sup>5</sup> 5  | <sup>8</sup> 8  |

70 Subtracting 3-digit numbers, regrouping in 2 places

**Using the Book** Illustrate the problem in the display by setting out 9 hundreds, 4 tens, and 7 ones. Say, "Can we take away 8 ones? What must we do? etc." In this way, discuss regrouping of the ten into ones and later a hundred into tens.

Use a place-value chart to record the work.

Do page 70 orally in class with children taking turns at the chalkboard or on the overhead. Repeatedly mention the regrouping at each stage.

As the children become comfortable with the operations, assign them to do the exercises on page 71. Those children finished first may be given a mini-calculator to check their work and check other children's work.

Often, the Pacing suggests Level A children not be assigned as many exercises as Level B children. Level A assignment is shortened so that they too will have time to do some of the Activities. This will act as a motivator to Level A children.

- |   |   |
|---|---|
| 15. $\begin{array}{r} 423 \\ - 158 \\ \hline \end{array}$ | 16. $\begin{array}{r} 734 \\ - 345 \\ \hline \end{array}$ |
| 17. $\begin{array}{r} 881 \\ - 697 \\ \hline \end{array}$ | 18. $\begin{array}{r} 344 \\ - 156 \\ \hline \end{array}$ |
| 19. $\begin{array}{r} 525 \\ - 337 \\ \hline \end{array}$ | 20. $\begin{array}{r} 633 \\ - 358 \\ \hline \end{array}$ |

# Practice

Copy and subtract.

- |   |  |  |  |  |
|---|--|--|--|--|
| 1. (a) $\begin{array}{r} 754 \\ -426 \\ \hline 328 \end{array}$ | (b) $\begin{array}{r} 976 \\ -257 \\ \hline 719 \end{array}$ | (c) $\begin{array}{r} 628 \\ -319 \\ \hline 309 \end{array}$ | (d) $\begin{array}{r} 881 \\ -546 \\ \hline 335 \end{array}$ | (e) $\begin{array}{r} 498 \\ -279 \\ \hline 219 \end{array}$ |
| 2. (a) $\begin{array}{r} 836 \\ -374 \\ \hline 462 \end{array}$ | (b) $\begin{array}{r} 578 \\ -387 \\ \hline 191 \end{array}$ | (c) $\begin{array}{r} 728 \\ -154 \\ \hline 574 \end{array}$ | (d) $\begin{array}{r} 369 \\ -189 \\ \hline 180 \end{array}$ | (e) $\begin{array}{r} 749 \\ -281 \\ \hline 468 \end{array}$ |
| 3. (a) $\begin{array}{r} 625 \\ -236 \\ \hline 389 \end{array}$ | (b) $\begin{array}{r} 421 \\ -176 \\ \hline 245 \end{array}$ | (c) $\begin{array}{r} 738 \\ -269 \\ \hline 469 \end{array}$ | (d) $\begin{array}{r} 421 \\ -377 \\ \hline 44 \end{array}$  | (e) $\begin{array}{r} 645 \\ -487 \\ \hline 158 \end{array}$ |
| 4. (a) $\begin{array}{r} 953 \\ -827 \\ \hline 126 \end{array}$ | (b) $\begin{array}{r} 521 \\ -499 \\ \hline 22 \end{array}$  | (c) $\begin{array}{r} 394 \\ -188 \\ \hline 206 \end{array}$ | (d) $\begin{array}{r} 823 \\ -197 \\ \hline 626 \end{array}$ | (e) $\begin{array}{r} 254 \\ -226 \\ \hline 28 \end{array}$  |
| 5. (a) $\begin{array}{r} 643 \\ -147 \\ \hline 496 \end{array}$ | (b) $\begin{array}{r} 274 \\ -192 \\ \hline 82 \end{array}$  | (c) $\begin{array}{r} 823 \\ -397 \\ \hline 426 \end{array}$ | (d) $\begin{array}{r} 452 \\ -176 \\ \hline 276 \end{array}$ | (e) $\begin{array}{r} 746 \\ -558 \\ \hline 188 \end{array}$ |
| 6. (a) $\begin{array}{r} 932 \\ -653 \\ \hline 279 \end{array}$ | (b) $\begin{array}{r} 645 \\ -218 \\ \hline 427 \end{array}$ | (c) $\begin{array}{r} 321 \\ -246 \\ \hline 75 \end{array}$  | (d) $\begin{array}{r} 486 \\ -268 \\ \hline 218 \end{array}$ | (e) $\begin{array}{r} 264 \\ -137 \\ \hline 127 \end{array}$ |
| 7. (a) $\begin{array}{r} 352 \\ -165 \\ \hline 187 \end{array}$ | (b) $\begin{array}{r} 493 \\ -276 \\ \hline 217 \end{array}$ | (c) $\begin{array}{r} 647 \\ -468 \\ \hline 179 \end{array}$ | (d) $\begin{array}{r} 421 \\ -327 \\ \hline 94 \end{array}$  | (e) $\begin{array}{r} 847 \\ -619 \\ \hline 228 \end{array}$ |



## OBJECTIVE

To introduce the use of the function machine

## PACING

Level A All

Level B All

Level C All

## MATERIALS

"mystery" box, cutouts of various "   bles"

## RELATED AIDS

BFA COMP LAB I—13, 48, 69.

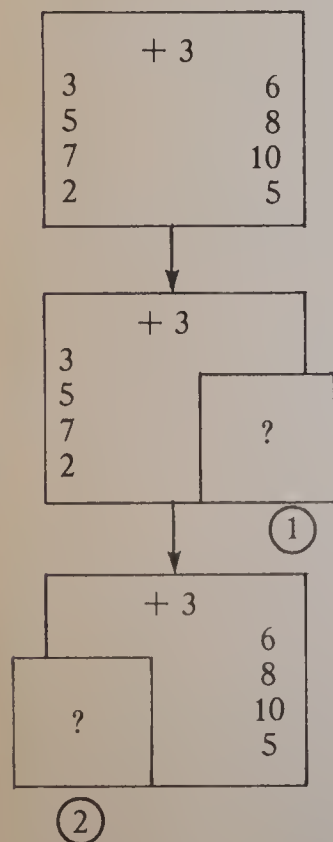
## SUGGESTIONS

**Initial Activity** Set up a situation similar to that at the top of page 72. Do several examples, using cutouts, and have the children discuss what happened inside the mystery box.

Repeat the above procedure using numbers. Discuss what happened.

## ACTIVITIES

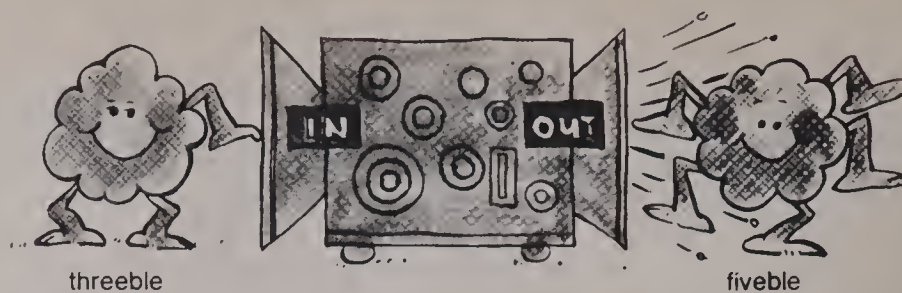
1. Have the children make their own function machines with sheets of paper. The children would show the number on the left side and write the finished state (1). To check, the function paper can be moved to the right to show the answer column on the right side of the page (2).



The children could exchange sheets, or the function sheets could be available in a central location.

## The Mystery Machine

This is a mystery machine.  
Strange things happen inside.



What happened inside the machine?

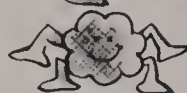
What would come out if:

- A "twoble" went in?



a fourble

- A "fourble" went in?



a sixble

3. A "oneble" went in?



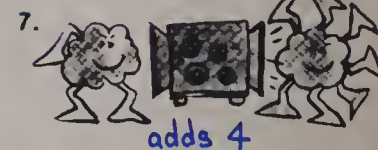
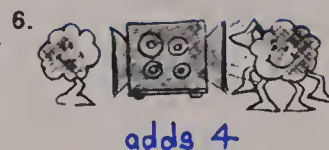
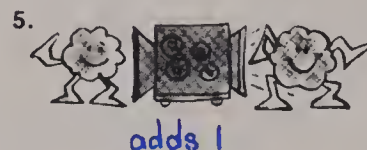
a threeble

4. Now change what happens inside the machine so that it is an "add 9" machine.

What comes out now?

threeble → twelveble  
twoble → elevenble  
fourble → thirteenble  
oneble → tenble

Tell what happens.



72 Function machines

**Using the Book** Discuss the display and do page 72 orally in class. Ask, "Why?" and "What makes you think that?" to promote the ability of the children to put into words what they are thinking, and to tell you whether they are on the right track.

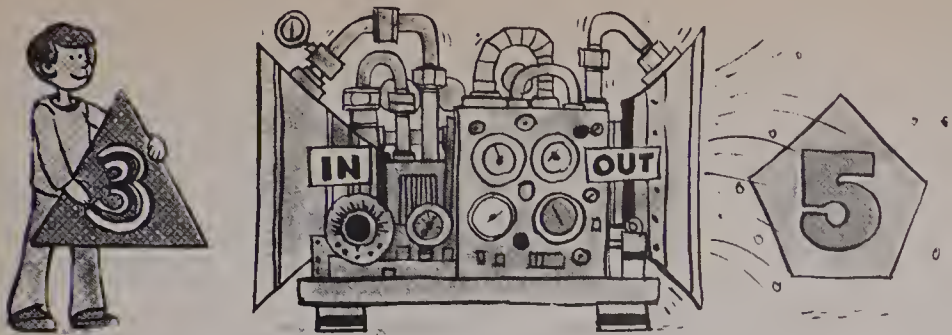
Discuss the display on page 73. Assign the exercises. Be explicit with an example of how you expect children to do these in their exercise books. If some children have difficulty recording their answers, work with these children allowing them to give you the answers orally.

2. Make a "mystery box" out of a cardboard carton. It could be put at a Math Centre and used with paper strips being pulled through to illustrate number changes.

3. Ask the children to draw a large function machine for the bulletin board or Math Centre (and colour it vividly). Each day a number is shown as the input and another as the output. Challenge: What happens inside the machine that day?

4. Do Problem of the Week #9.

# The Mystery Machine Changes Numbers



What number went into the machine? 3  
 What number came out of the machine? 5  
 What happened to the "3" inside the machine? + 2

What happens inside these machines?

|      |  |         |       |   |        |       |  |        |  |        |
|------|--|---------|-------|---|--------|-------|--|--------|--|--------|
| 1. 2 |  | 4 (+ 2) |       | 4 |        | 6 + 2 |  | 9      |  | 10 + 1 |
| 4. 6 |  | 10 + 4  | 5. 10 |   | 15 + 5 | 6. 8  |  | 11 + 3 |  |        |
| 7. 3 |  | 9 + 6   | 8. 7  |   | 12 + 5 | 9. 2  |  | 6 + 4  |  |        |

What happens inside these machines?

|        |  |         |       |   |       |       |  |       |  |       |
|--------|--|---------|-------|---|-------|-------|--|-------|--|-------|
| 10. 8  |  | 6 (- 2) |       | 4 |       | 3 - 1 |  | 9     |  | 4 - 5 |
| 13. 10 |  | 9 - 1   | 14. 6 |   | 3 - 3 | 15. 8 |  | 5 - 3 |  |       |
| 16. 5  |  | 3 - 2   | 17. 7 |   | 2 - 5 | 18. 9 |  | 6 - 3 |  |       |

To subtract to three digits involving regrouping with “zeros”

|         |                               |
|---------|-------------------------------|
| Level A | First 5 questions in each row |
| Level B | All                           |
| Level C | All                           |

zeros

centimetre cubes, place-value chart,  
window card to isolate columns

## BFA COMP LAB 1—61, 62.

**Initial Activity** Review the idea that zero is a place holder (for the empty set). Demonstrate an example using centimetre cubes and place-value chart with stir sticks and number cards.

1. Direct children to use the place-value chart to show the number. Then they are to subtract the second number, as indicated. They are to draw the first number and the answer as shown on the place-value chart.

$$\begin{array}{r} 20 \\ - 4 \\ \hline 20 \\ - 18 \\ \hline \end{array} \quad \begin{array}{r} 30 \\ - 6 \\ \hline 40 \\ - 16 \\ \hline \end{array} \quad \begin{array}{r} 60 \\ - 9 \\ \hline 30 \\ - 12 \\ \hline \end{array} \quad \begin{array}{r} 50 \\ - 8 \\ \hline 50 \\ - 34 \\ \hline \end{array}$$

2. Use a place-value chart with number cards. Show each number.

|    |    |    |    |    |
|----|----|----|----|----|
| 10 | 80 | 64 | 50 | 40 |
| 30 | 90 | 26 | 60 | 73 |

3. Make two fish with these "scales". On one fish write the questions as illustrated. On the second fish place all the answers in the appropriate scales. Cut the second fish into separate pieces. The child is challenged to put the fish together by placing the answers on the matching questions. Answers are in circles.

## Subtract.

|       |                                  |
|-------|----------------------------------|
| 80    | You have 0 ones.                 |
| -16   | You can't subtract 6 ones.       |
| ----- | So you regroup 1 ten as 10 ones. |

|   |   |
|---|---|
| t | o |
| 8 | 0 |
| 1 | 6 |
| 6 | 4 |

304      You have 0 tens.  
- 22      You can't subtract 2 tens.  
———      So you must regroup 1 hundred as 10 tens.

|   |   |   |
|---|---|---|
| h | t | o |
| 3 | 0 | 4 |
|   | 2 | 2 |
| 2 | 8 | 2 |

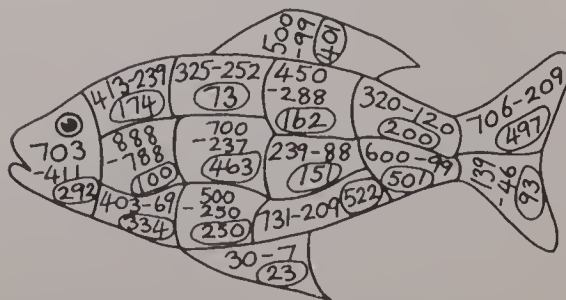
Copy and complete. Watch for “zeros”!

|   |   |   |   |   |   |
|---|---|---|---|---|---|
| 1. $\begin{array}{r} 30 \\ - 9 \\ \hline \end{array}$         | 2. $\begin{array}{r} 20 \\ - 5 \\ \hline 15 \end{array}$      | 3. $\begin{array}{r} 50 \\ - 4 \\ \hline 46 \end{array}$      | 4. $\begin{array}{r} 80 \\ - 43 \\ \hline 37 \end{array}$     | 5. $\begin{array}{r} 60 \\ - 24 \\ \hline 36 \end{array}$     | 6. $\begin{array}{r} 90 \\ - 37 \\ \hline 53 \end{array}$     |
| 7. $\begin{array}{r} 60 \\ - 47 \\ \hline 13 \end{array}$     | 8. $\begin{array}{r} 80 \\ - 34 \\ \hline 46 \end{array}$     | 9. $\begin{array}{r} 70 \\ - 28 \\ \hline 42 \end{array}$     | 10. $\begin{array}{r} 40 \\ - 19 \\ \hline 21 \end{array}$    | 11. $\begin{array}{r} 90 \\ - 53 \\ \hline 37 \end{array}$    | 12. $\begin{array}{r} 50 \\ - 26 \\ \hline 24 \end{array}$    |
| 13. $\begin{array}{r} 405 \\ - 43 \\ \hline 362 \end{array}$  | 14. $\begin{array}{r} 607 \\ - 25 \\ \hline 582 \end{array}$  | 15. $\begin{array}{r} 804 \\ - 42 \\ \hline 762 \end{array}$  | 16. $\begin{array}{r} 506 \\ - 34 \\ \hline 472 \end{array}$  | 17. $\begin{array}{r} 302 \\ - 71 \\ \hline 231 \end{array}$  | 18. $\begin{array}{r} 907 \\ - 54 \\ \hline 853 \end{array}$  |
| 19. $\begin{array}{r} 808 \\ - 145 \\ \hline 663 \end{array}$ | 20. $\begin{array}{r} 709 \\ - 236 \\ \hline 473 \end{array}$ | 21. $\begin{array}{r} 905 \\ - 432 \\ \hline 473 \end{array}$ | 22. $\begin{array}{r} 303 \\ - 141 \\ \hline 162 \end{array}$ | 23. $\begin{array}{r} 508 \\ - 226 \\ \hline 282 \end{array}$ | 24. $\begin{array}{r} 806 \\ - 353 \\ \hline 453 \end{array}$ |

74 Subtraction to 3 digits regrouping with zeros

**Using the Book** Have the children look at the top section of the display. Point out to them that in  $80 - 16$ : (a) there are no “ones” to take away from, (b) therefore we must break one ten into ones which we do by crossing out the 8, replacing it with 7, and writing “10” above the one’s column, (c) now we can subtract as done before. Repeat these steps while looking at  $304 - 22$ . Make a flow chart to illustrate the process involved.

Assign the exercises, reminding the children that some answers are supplied if needed (Exercises 2-5).





# Zeros in Subtraction

Subtract.

| h | t | o |
|---|---|---|
| 7 | 0 | 3 |
| 3 | 4 | 6 |

1. You have 3 ones.
2. You can't subtract 6 ones.
3. You can't regroup 0 tens.
4. Regroup 1 hundred first to get 10 ones.

| h | t | o |
|---|---|---|
| 7 | 0 | 3 |
| 3 | 4 | 6 |
| 3 | 5 | 7 |

5. Now regroup 1 ten as 10 ones.  
We have 13 ones now.
6. Now subtract the ones.
7. Now subtract the tens.
8. Now subtract the hundreds.

- |  |  |  |  |  |
|--|--|--|--|--|
| 1. $\begin{array}{r} 604 \\ -265 \\ \hline 339 \end{array}$  | 2. $\begin{array}{r} 802 \\ -454 \\ \hline 348 \end{array}$  | 3. $\begin{array}{r} 503 \\ -236 \\ \hline 267 \end{array}$  | 4. $\begin{array}{r} 706 \\ -447 \\ \hline 259 \end{array}$  | 5. $\begin{array}{r} 401 \\ -235 \\ \hline 166 \end{array}$  |
| 6. $\begin{array}{r} 806 \\ -448 \\ \hline 358 \end{array}$  | 7. $\begin{array}{r} 403 \\ -136 \\ \hline 267 \end{array}$  | 8. $\begin{array}{r} 602 \\ -253 \\ \hline 349 \end{array}$  | 9. $\begin{array}{r} 501 \\ -122 \\ \hline 379 \end{array}$  | 10. $\begin{array}{r} 304 \\ -156 \\ \hline 148 \end{array}$ |
| 11. $\begin{array}{r} 902 \\ -524 \\ \hline 378 \end{array}$ | 12. $\begin{array}{r} 507 \\ -248 \\ \hline 259 \end{array}$ | 13. $\begin{array}{r} 406 \\ -139 \\ \hline 267 \end{array}$ | 14. $\begin{array}{r} 803 \\ -314 \\ \hline 489 \end{array}$ | 15. $\begin{array}{r} 705 \\ -258 \\ \hline 447 \end{array}$ |
| 16. $\begin{array}{r} 408 \\ -149 \\ \hline 259 \end{array}$ | 17. $\begin{array}{r} 605 \\ -268 \\ \hline 337 \end{array}$ | 18. $\begin{array}{r} 805 \\ -526 \\ \hline 279 \end{array}$ | 19. $\begin{array}{r} 504 \\ -287 \\ \hline 217 \end{array}$ | 20. $\begin{array}{r} 804 \\ -379 \\ \hline 425 \end{array}$ |

Subtraction 3 digits regrouping with zeros 75

**Using the Book** Refer to the display. Establish the fact that you cannot subtract 6 ones from 3 ones. Then ask how we can regroup to get some ones by eliciting the answer that we need to regroup 1 hundred to 10 tens and then regroup one of these tens to get 10 ones. Complete the discussion of the display problem.

Assign one problem at a time until you feel that the children are able to progress on their own.

Add 146 to me and you get 400.  
Subtract 300 from me and you get 196.  
Add 117 to me and you get 711.

## OBJECTIVE

To subtract three-digit numbers with regrouping (zeros involved)

## PACING

Level A 1-16  
Level B All  
Level C All

## MATERIALS

place-value charts, window sheet, graph paper

## RELATED AIDS

BFA COMP LAB I—63, 65.  
HMS—DM17.

## SUGGESTIONS

**Initial Activity** Before assigning the page work through several examples using the cutouts to illustrate trading 1 ten for 10 ones and 1 hundred for 10 tens. Discuss the following and complete on the chalkboard.

- 2 hundreds + 5 tens + 0 ones  
= 2 hundreds + 4 tens + 10 ones
- 3 hundreds + 0 tens + 6 ones  
= 2 hundreds + 10 tens + 6 ones
- 4 hundreds + 0 tens + 0 ones  
= 3 hundreds + 10 tens + 0 ones  
= 3 hundreds + 10 tens + 0 ones

## ACTIVITIES

1. Let the children play the "Shuffle Numbers" game as described in Variation 2 in the Activity Reservoir.

2. Let the children play Tic Tac Toe. Each pair of children prepares a Tic Tac Toe board. They place the numbers (answers to the questions) at random on the board. Each player takes turns solving a question and placing his/her X or O on that answer on the board. Three X's or O's in a row wins.

|     |     |     |
|-----|-----|-----|
| 30  | 7   | 88  |
| 101 | 300 | 594 |
| 15  | 496 | 254 |

Who am I?

Add 12 to me and you get 27.  
Subtract 23 from me and you get 7.  
Add 13 to me and you get 20.  
Subtract 36 from me and you get 52.  
Add 39 to me and you get 140.  
Subtract 109 from me and you get 191.

OBJECTIVE

To practise addition and subtraction

PACING

- Level A First 4 questions in each row
- Level B All
- Level C 1-5, 14-20, 26-35

EXTRA PRACTICE

Add.

1. 5  
3  
+ 4  
—

3. 24  
+ 35  
—

5. 43  
+ 29  
—

7. 257  
+ 136  
—

2. 6  
7  
+ 2  
—

4. 61  
+ 37  
—

6. 274  
+ 19  
—

8. 567  
+ 255  
—

Subtract.

1. 87  
- 45  
—

3. 47  
- 18  
—

5. 281  
- 65  
—

7. 462  
- 174  
—

2. 75  
- 53  
—

4. 64  
- 36  
—

6. 764  
- 37  
—

8. 835  
- 457  
—

Practice

Add.

1. 1  
2  
+ 9  
—  
12

6. 46  
+ 23  
—  
69

11. 24  
+ 49  
—  
73

16. 337  
+ 260  
—  
597

2. 2  
3  
+ 5  
—  
10

7. 81  
+ 17  
—  
98

12. 46  
+ 57  
—  
103

17. 694  
+ 107  
—  
801

3. 1  
4  
+ 4  
—  
9

8. 32  
+ 40  
—  
72

13. 378  
+ 24  
—  
402

18. 504  
+ 308  
—  
812

4. 2  
1  
+ 3  
—  
6

9. 54  
+ 45  
—  
99

14. 507  
+ 57  
—  
564

19. 369  
+ 453  
—  
822

5. 2  
1  
+ 6  
—  
9

10. 26  
+ 52  
—  
78

15. 352  
+ 39  
—  
391

20. 291  
+ 439  
—  
730

Subtract.

21. 43  
- 21  
—  
22

26. 274  
- 27  
—  
247

31. 972  
- 396  
—  
576

22. 68  
- 42  
—  
26

27. 463  
- 45  
—  
418

32. 657  
- 168  
—  
489

23. 49  
- 20  
—  
29

28. 564  
- 29  
—  
535

33. 498  
- 209  
—  
289

24. 73  
- 24  
—  
49

29. 740  
- 326  
—  
414

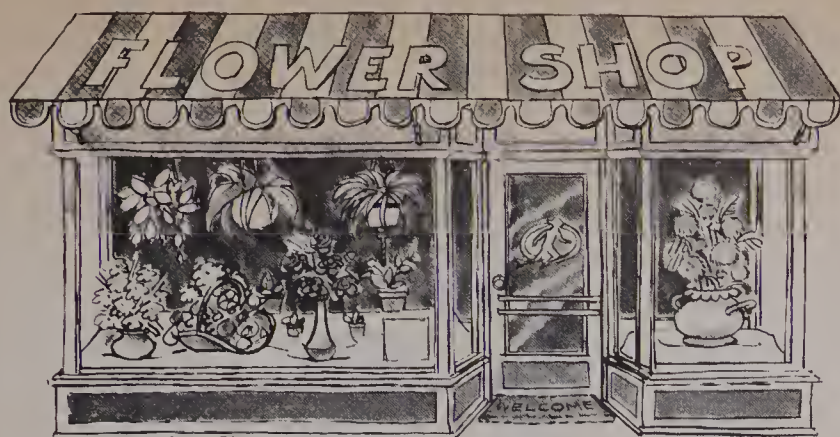
34. 897  
- 488  
—  
409

25. 32  
- 14  
—  
18

30. 604  
- 253  
—  
351

35. 304  
- 287  
—  
17

Using the Book The children should work independently on these questions. If any children have unusual difficulty with this page, you may want to set up remedial work based on the type of questions found on this page.



Write the number sentences and find the answers.

1. There were 18 hanging baskets.  
A man bought 12 of them.  
How many are left? **6**
2. A lady bought 26 cactus plants.  
She also bought 12 flowering plants.  
How many plants did she buy altogether? **38**
3. The florist bought 365 plants.  
He sold 137 plants.  
How many does he have left? **228**
4. There are 252 green plants.  
There are 178 dried plants.  
How many more green plants are there? **74**
5. The florist planted 189 flowers.  
He still has 36 to plant.  
How many flowers will he plant altogether? **225**

Problem solving 77

**Using the Book** Be certain all children understand  
(a) the words in these short problems (see Vocabulary) and  
(b) the preferred answer format.

#### DOWN

- a 2 hundreds + 5 tens
- b 1 ten
- c 3 hundreds + 4 tens + 7
- e 7 hundreds + 4 tens + 2
- f 6 hundreds + 3
- h 9 hundreds + 8 tens
- i 3 hundreds
- m 4 hundreds + 1 ten + 5
- n 2 hundreds + 4 tens
- p 3 tens

#### ACROSS

- a 2 hundreds + 1 ten + 3 ones
- d 5 hundreds + 4 ones
- e 7 hundreds + 6 tens
- g 7 hundreds + 9 tens + 3 ones
- j 4 tens
- k 8 tens
- l 2 hundreds + 3 tens + 4 ones
- n 2 hundreds
- o 1 hundred + 3 tens + 4 ones
- q 5 hundreds

## OBJECTIVE

To solve problems using addition and subtraction, with and without regrouping

## PACING

Level A All  
Level B All  
Level C All

## VOCABULARY

sentences, hanging baskets, cactus, florist

## SUGGESTIONS

**Initial Activity** Review the processes involved in regrouping (flow chart). Discuss a problem similar to Exercise 1 and emphasize the words that help determine which operation is necessary.

*Example*

Exercise 1:

"How many are left?"

"left" implies a difference  $\therefore$  subtract.

Point out that "how many more" and "how many altogether" are the keys to subtraction and addition respectively.

## ACTIVITIES

1. Arrange a visit to a flower shop as a joint math and science trip. Discuss in advance of the trip what children might see and what problems they are to answer after returning.

2. Prepare several word problems similar to those on this page. Print them on the outside of standard-size envelopes. Prepare the matching subtraction facts on small cards. Task is to place each fact in its appropriate envelope. Have another child check.

3. Prepare this subtraction crossnumber puzzle for distribution.

|    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|
|    |    | a2 | b1 | c3 |    |    |
|    |    | d5 | 0  | 4  |    |    |
| e7 | f6 | 0  |    | g7 | h9 | i3 |
| j4 | 0  |    |    |    | k8 | 0  |
| l2 | 3  | m4 |    | n2 | 0  | 0  |
|    |    | o1 | p3 | 4  |    |    |
|    |    | q5 | 0  | 0  |    |    |



## OBJECTIVE

To evaluate achievement of the chapter objectives

## PACING

Level A All  
Level B All  
Level C All

## RELATED AIDS

HMS—DM1 and DM18.

## EXTRA PRACTICE

Add.

1.  $\begin{array}{r} 73 \\ + 4 \\ \hline \end{array}$
2.  $\begin{array}{r} 55 \\ + 3 \\ \hline \end{array}$
3.  $\begin{array}{r} 61 \\ + 37 \\ \hline \end{array}$
4.  $\begin{array}{r} 43 \\ + 56 \\ \hline \end{array}$
5.  $\begin{array}{r} 172 \\ + 124 \\ \hline \end{array}$
6.  $\begin{array}{r} 325 \\ + 232 \\ \hline \end{array}$
7.  $\begin{array}{r} 734 \\ + 546 \\ \hline \end{array}$
8.  $\begin{array}{r} 546 \\ + 252 \\ \hline \end{array}$
9.  $\begin{array}{r} 674 \\ + 147 \\ \hline \end{array}$
10.  $\begin{array}{r} 488 \\ + 374 \\ \hline \end{array}$

Subtract.

1.  $\begin{array}{r} 37 \\ - 5 \\ \hline \end{array}$
2.  $\begin{array}{r} 49 \\ - 7 \\ \hline \end{array}$
3.  $\begin{array}{r} 76 \\ - 43 \\ \hline \end{array}$
4.  $\begin{array}{r} 84 \\ - 53 \\ \hline \end{array}$
5.  $\begin{array}{r} 277 \\ - 145 \\ \hline \end{array}$
6.  $\begin{array}{r} 578 \\ - 257 \\ \hline \end{array}$
7.  $\begin{array}{r} 681 \\ - 254 \\ \hline \end{array}$
8.  $\begin{array}{r} 431 \\ - 217 \\ \hline \end{array}$
9.  $\begin{array}{r} 808 \\ - 654 \\ \hline \end{array}$
10.  $\begin{array}{r} 442 \\ - 278 \\ \hline \end{array}$

## Chapter Test

Add.

1.  $\begin{array}{r} 92 \\ + 4 \\ \hline 96 \end{array}$
2.  $\begin{array}{r} 73 \\ + 6 \\ \hline 79 \end{array}$
3.  $\begin{array}{r} 54 \\ + 42 \\ \hline 96 \end{array}$
4.  $\begin{array}{r} 86 \\ + 13 \\ \hline 99 \end{array}$
5.  $\begin{array}{r} 121 \\ + 43 \\ \hline 164 \end{array}$
6.  $\begin{array}{r} 420 \\ + 38 \\ \hline 458 \end{array}$
7.  $\begin{array}{r} 234 \\ + 122 \\ \hline 356 \end{array}$
8.  $\begin{array}{r} 365 \\ + 403 \\ \hline 768 \end{array}$
9.  $\begin{array}{r} 635 \\ + 116 \\ \hline 751 \end{array}$
10.  $\begin{array}{r} 462 \\ + 279 \\ \hline 741 \end{array}$
11.  $\begin{array}{r} 148 \\ + 376 \\ \hline 524 \end{array}$
12.  $\begin{array}{r} 324 \\ + 386 \\ \hline 710 \end{array}$

Subtract.

13.  $\begin{array}{r} 25 \\ - 3 \\ \hline 22 \end{array}$
14.  $\begin{array}{r} 49 \\ - 6 \\ \hline 43 \end{array}$
15.  $\begin{array}{r} 57 \\ - 24 \\ \hline 33 \end{array}$
16.  $\begin{array}{r} 68 \\ - 35 \\ \hline 33 \end{array}$
17.  $\begin{array}{r} 147 \\ - 23 \\ \hline 124 \end{array}$
18.  $\begin{array}{r} 489 \\ - 45 \\ \hline 444 \end{array}$
19.  $\begin{array}{r} 857 \\ - 103 \\ \hline 754 \end{array}$
20.  $\begin{array}{r} 678 \\ - 249 \\ \hline 429 \end{array}$
21.  $\begin{array}{r} 241 \\ - 135 \\ \hline 106 \end{array}$
22.  $\begin{array}{r} 532 \\ - 227 \\ \hline 305 \end{array}$
23.  $\begin{array}{r} 214 \\ - 123 \\ \hline 91 \end{array}$
24.  $\begin{array}{r} 875 \\ - 291 \\ \hline 584 \end{array}$
25.  $\begin{array}{r} 546 \\ - 358 \\ \hline 188 \end{array}$
26.  $\begin{array}{r} 453 \\ - 266 \\ \hline 187 \end{array}$
27.  $\begin{array}{r} 320 \\ - 142 \\ \hline 178 \end{array}$
28.  $\begin{array}{r} 514 \\ - 135 \\ \hline 379 \end{array}$
29.  $\begin{array}{r} 707 \\ - 468 \\ \hline 239 \end{array}$
30.  $\begin{array}{r} 900 \\ - 437 \\ \hline 463 \end{array}$

31. Dina has 56 stamps.

Terry has 58 stamps.

How many stamps do they have altogether? **114**

32. Ajay has 342 stamps.

Nadine has 157 stamps.

How many more stamps does Ajay have? **185**

78 Chapter 2 test

**Using the Book** Each child should do this test independently under supervision. Assistance should be given only when the instructions are not understood. After the work has been corrected, you should provide appropriate remedial work. You may wish to reteach if a large number of children had difficulty with a particular topic or concept.

The following chart will help in this regard. The specific objectives are listed in the Chapter Overview (see page 36).

An alternate Chapter Test can be found in the Holt Mathematics System Duplicating Masters available for use with this grade level.

| Test Item              | Objective | Text Page Number             |
|------------------------|-----------|------------------------------|
| 1-12                   | C         | 39, 44, 46, 48, 52           |
| 5-12, 17-30            | B         | 41, 42                       |
| 13-30                  | D         | 56, 58, 60, 62<br>65, 67, 70 |
| 6, 8, 19, 27<br>29, 30 | E         | 74, 75                       |
| 31, 32                 | F         | 49, 57, 64, 77               |

# Cumulative Review

Add.

|   |   |   |   |  |  |
|---|---|---|---|--|--|
| 1. $\begin{array}{r} 1 \\ 4 \\ + 4 \\ \hline 9 \end{array}$ | 2. $\begin{array}{r} 1 \\ 2 \\ + 3 \\ \hline 6 \end{array}$ | 3. $\begin{array}{r} 2 \\ 2 \\ + 3 \\ \hline 7 \end{array}$ | 4. $\begin{array}{r} 3 \\ 2 \\ + 4 \\ \hline 9 \end{array}$ | 5. $\begin{array}{r} 1 \\ 9 \\ + 5 \\ \hline 15 \end{array}$ | 6. $\begin{array}{r} 3 \\ 8 \\ + 4 \\ \hline 15 \end{array}$ |
|---|---|---|---|--|--|

|   |   |  |   |   |   |
|---|---|--|---|---|---|
| 7. $\begin{array}{r} 49 \\ + 24 \\ \hline 73 \end{array}$ | 8. $\begin{array}{r} 349 \\ + 32 \\ \hline 381 \end{array}$ | 9. $\begin{array}{r} 635 \\ + 206 \\ \hline 841 \end{array}$ | 10. $\begin{array}{r} 362 \\ + 429 \\ \hline 791 \end{array}$ | 11. $\begin{array}{r} 374 \\ + 589 \\ \hline 963 \end{array}$ | 12. $\begin{array}{r} 646 \\ + 298 \\ \hline 944 \end{array}$ |
|---|---|--|---|---|---|

Subtract.

|  |  |   |   |   |   |
|--|--|---|---|---|---|
| 13. $\begin{array}{r} 95 \\ - 41 \\ \hline 54 \end{array}$ | 14. $\begin{array}{r} 176 \\ - 32 \\ \hline 144 \end{array}$ | 15. $\begin{array}{r} 987 \\ - 542 \\ \hline 445 \end{array}$ | 16. $\begin{array}{r} 843 \\ - 426 \\ \hline 417 \end{array}$ | 17. $\begin{array}{r} 525 \\ - 146 \\ \hline 379 \end{array}$ | 18. $\begin{array}{r} 602 \\ - 468 \\ \hline 134 \end{array}$ |
|--|--|---|---|---|---|

19. How many hundreds?  
457 **4 hundreds**
20. How many tens?  
207 **0 tens**

21. Which is greater?  
56 or 74 **74**    581 or 591 **591**    249 or 942 **942**

22. Write the numeral.  
(a) fifty-six **56**    (b) forty-one **41**  
(c) 2 hundreds 0 tens 7 ones **207**

23. Raj has 43 stamps.  
Angelo has 37 stamps.  
How many stamps do they have altogether? **80**
24. José has 280 stamps.  
Fernando has 142 stamps.  
How many more stamps does José have? **138**

## OBJECTIVE

To review and test selected concepts and skills previously covered

**Using the Book** This page may be used for diagnostic and remedial as well as review purposes. Children should check their work, correct any errors, and review the pages that contain any problems of the type they missed. Some children can do this on their own while others may need help. If a large number of children have a particular problem incorrect, you may want to reteach that topic to the group, and then assign a duplicated worksheet to reinforce that topic or refer to an appropriate skill card in the BFA Computational Skills Kit I.

| Test Item    | Text Page Number |
|--------------|------------------|
| 1-6          | 30, 31           |
| 7            | 46, 47           |
| 8-10         | 48               |
| 11, 12       | 52, 53           |
| 13           | 58               |
| 14, 15       | 65               |
| 16, 17       | 70               |
| 18           | 75               |
| 19, 20       | 42               |
| 21           | 43               |
| 22(a), 22(b) | 5                |
| 22(c)        | 42               |
| 23           | 46, 49           |
| 24           | 74, 75           |

# CHAPTER 3 OVERVIEW

This chapter includes three-dimensional shapes, two-dimensional shapes, symmetry, similarity, and the process of sorting.

## OBJECTIVES

- A To recognize and name pictures of cubes, pyramids, cylinders, triangular prisms, rectangular prisms, and cones
- B To recognize and name pictures of triangles, circles, squares, and rectangles
- C To draw a line of symmetry on a symmetric shape, and to identify similar shapes
- D To state a rule for a simple sorting resulting in two sets

## BACKGROUND

Solid shapes are studied first, then plane shapes, then one-dimensional shapes. After making and naming certain solids, their features are studied.

Plane shapes are geometrical concepts. For example, a triangle is a set of points comprising the vertices and the three line segments joining the vertices. The plane shapes are developed intuitively by tracing the faces of solids and by making polygons on dot paper.

A shape is symmetric with respect to a line of symmetry if one half matches the other half when folded over the line of symmetry. This means that for any point on one half of the shape there is a corresponding point on the other half such that the line segment joining these two points is perpendicular to and bisected by the line of symmetry.

Two shapes are similar if one is the enlargement of the other — if one is just a larger version of the

other. This concept is developed intuitively at this time and not through a formal study of proportion.

In sorting we use the rule of “a group has one property, the balance of the group does not have that property or it has other properties.” For example, the rule “red shoes are in one group and those not red are in the other group” might well be “the red shoes are in one group and the black shoes are in the other group.”

## MATERIALS

solid objects of the shapes shown  
paper, scissors, paint  
Plasticine, toothpicks or straws  
dot paper — square and triangular (DM23 and DM24)  
similar shapes  
collection of things for sorting (see Materials for lessons in this chapter)

## CAREER AWARENESS

### Grocery Store Manager [92]

A store manager is responsible for all aspects of the operation of the store and hence must have a knowledge of all the services and commodities offered.

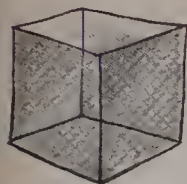
The manager determines the sale prices and sees that the products are labelled accordingly. The manager hires staff that is reliable, attentive to the needs of the customers, and trustworthy.

While some managers earn their qualifications on the job, most managers today are graduates of schools of business and administration with experience in the retail business. Managers are often paid a salary plus a bonus based on sales over a set quota.

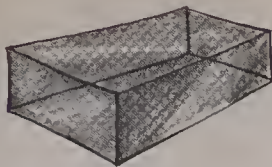


# Shapes

cube



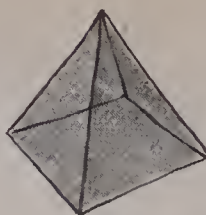
rectangular prism



triangular prism



pyramid









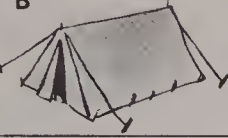

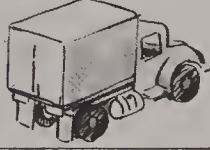
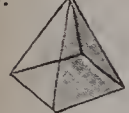





Make a collection of these shapes.

Copy the names of the shapes.

Place the correct letter beside each name.

1. cube → B

|  |  |  |  |   |
|--|--|--|--|---|
| 1.<br>   | A<br>   | B<br>   | C<br>   | D<br>   |
| 2.<br>   | A<br>   | B<br>   | C<br>   | D<br>   |
| 3.<br>  | A<br>  | B<br>  | C<br>  | D<br>  |
| 4.<br> | A<br> | B<br> | C<br> | D<br> |

Recognizing 3D shapes 81

**Using the Book** Ask, "How does the cube (hold one up) differ from the rectangular prism (hold one up)?" Elicit the fact that the faces of the cube are all the same size and shape but the rectangular prism has different-size faces. If this is not readily supplied, trace a face of the cube, cut it out, and have children place the cutout on the different faces of the cube. It always fits. When this is repeated with the rectangular prism the cutout does not always fit the faces.

Then discuss how the triangular prism differs from the rectangular prism. (It has two faces which are triangular and it has less faces.) Then elicit how the pyramid differs from the other shapes. Count the number of each kind of face in each shape. Some shapes have square corners, others do not.

Bring out that all these shapes have *flat* sides (surfaces). Be sure that the children understand the "matching technique" using arrows that is required in order to complete the exercises.

## OBJECTIVE

To recognize cubes, rectangular prisms, and pyramids

## PACING

Level A All  
Level B All  
Level C All

## VOCABULARY

cube, rectangular prism, triangular prism, pyramid

## MATERIALS

models of the shapes shown in the display

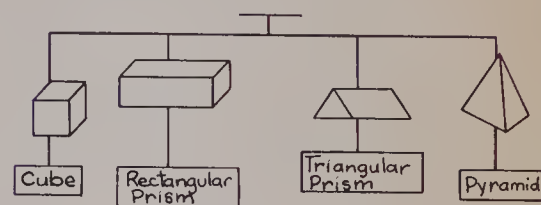
In the event the shapes are not available, have the children make models from prepared patterns. (See DM19 to DM21.)

## RELATED AIDS

HMS—DM19 to DM22.

## ACTIVITIES

1. Make a mobile of the shapes. Print the names on the shapes.



2. Take a neighbourhood walk and discuss shapes used in house building, trunks of trees, trucks, and so on. Concentrate on *one* shape each day.

3. Have the children make a list of objects found in the home (classroom) that resemble the four shapes in the display. They can use the words for the headings of each list or they can use pictures of the appropriate shapes.

### Answers:

2. rectangular prism → A  
3. triangular prism → B  
4. pyramid → D

OBJECTIVE

To recognize cones, cylinders, and spheres

PACING

- Level A All
- Level B All
- Level C All

VOCABULARY

cone, cylinder, ball (sphere)

MATERIALS

models of shapes shown in the display

RELATED AIDS

HMS—DM19 to DM22.

SUGGESTIONS

**Initial Activity** Continue the collection of the shapes to ensure the inclusion of these shapes. If some shapes are not available, model them from Plasticine.

Put together models of the shapes in the displays on pages 81 and 82. Then use this assignment card:

SHAPES

1. Sort the shapes into two piles.

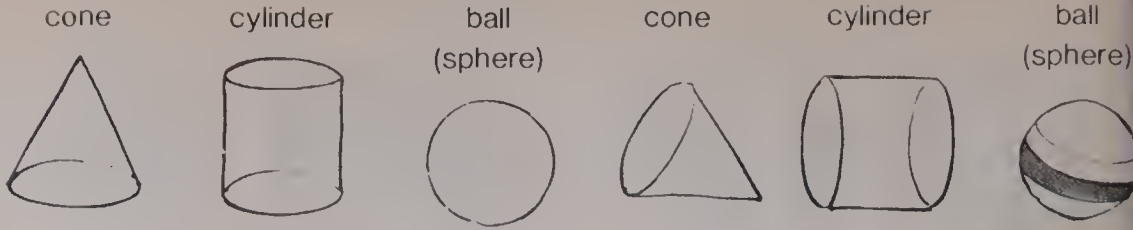
2. Write down the rule you used in sorting the shapes.

This assignment will assist the activities on pages 96 and 97.

ACTIVITIES

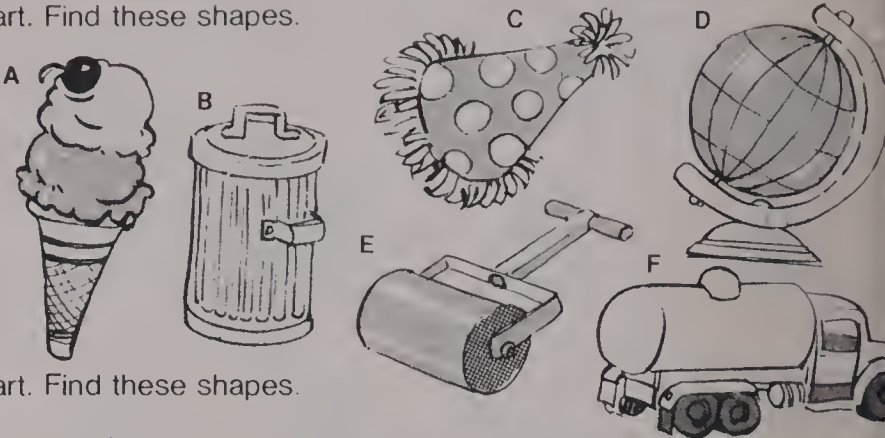
- Put together an assortment of the shapes in the display. Have children sort them into sets: cones, cylinders, and balls.
- Make a “curved shapes” mobile (DM20 and DM22).
- Take a neighbourhood walk and discuss the objects that have shapes like those on this page. Continue to make lists of objects that resemble the shapes being studied.

Curved Shapes



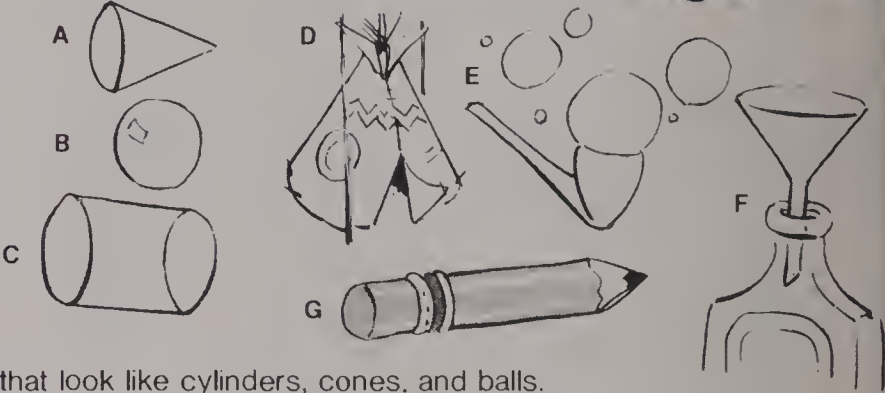
1. Copy this chart. Find these shapes.

|                  |     |
|------------------|-----|
| Cone             | A,C |
| Cylinder         | B,F |
| Ball<br>(sphere) | D   |



2. Copy this chart. Find these shapes.

|                  |     |
|------------------|-----|
| Cone             | D,F |
| Cylinder         | C,G |
| Ball<br>(sphere) | B,E |



3. Name things that look like cylinders, cones, and balls.

**Using the Book** Discuss models of the objects in the display. Ask how they differ from those on page 81. (They have curved surfaces.)

All children should be able to use the term “ball” for a sphere whereas *some* children will be ready for “sphere”.

Discuss how the shapes in this set of objects differ one from another. (Cones have 1 flat face, cylinders have 2, and spheres have none. Cylinders and balls roll but cones only roll around in a circle. Cones and cylinders can be stood on a face so they won’t roll away.)



# Tracing Shapes

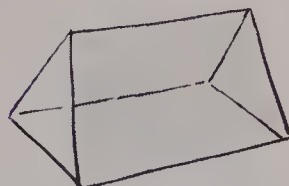
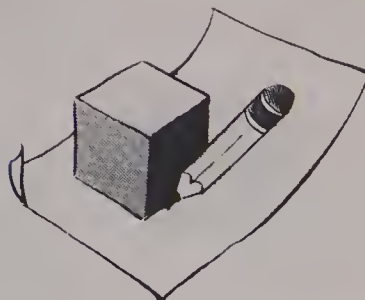
Some shapes have more faces than others.  
A face is flat.



faces



- Use chalk. Draw "faces" on your models.
- Count the number of flat faces on each model.  
**cylinder: 2 faces; cube: 6 faces; cone: 1 face**
- Place a cube on your page.  
Trace around it.  
  
Trace another face.  
Can you get a different shape? **no**
- Place a triangular prism on your page.  
Trace.  
  
Trace all the faces.  
How many different shapes did you trace? **2**



Trace the faces of each model.  
How many different shapes can you get?

- 2**
- 1**
- 1**
- 3**

Recognizing shapes of faces of 3D models 83

**Using the Book** Let the children be creative in drawing faces on the models. Some children feel certain shapes have a specific character, for instance, cones are sad, cubes are happy.

Discuss the meaning of the word *different* in respect to Exercises 3-8. Differences can relate to size of sides, number of sides, shape, number of corners, shape of corners, straight sides versus curved sides, etc. This will lead into the work on pages 86, ff.

## OBJECTIVES

To recognize the shapes of faces of solids

To trace the shapes of faces of solids

## PACING

Level A All  
Level B All  
Level C All

## MATERIALS

models of shapes shown on this page

## RELATED AIDS

HMS—DM19 to DM22.

## SUGGESTIONS

**Initial Activity** Discuss faces of shapes to develop intuitively the term *face*. Draw faces on several of the models using chalk.

The terms "edge" and "point" or "corner" (leading to vertex) may be introduced strictly in use (do not require the children to do this — this will come later).

## ACTIVITIES

- Prepare and use assignment cards such as:

I have 1 face.  
I roll.  
I have 1 sharp point.  
Who am I?

I have 6 faces.  
All my faces are the same.  
Who am I?

I have 2 faces.  
I roll.  
Who am I?

- Ask the children to trace the different faces of each shape, and then to cut out the tracings and glue them on a sheet of paper that has the picture of the solid shape on it.

- Have the child draw and complete this chart.

| Number of:      | Cylinder | Cone | Cube | Rectangular Prism | Triangular Prism |
|-----------------|----------|------|------|-------------------|------------------|
| curved surfaces |          |      |      |                   |                  |
| flat surfaces   |          |      |      |                   |                  |



## OBJECTIVES

To reinforce 3D shapes  
To make models of 3D shapes

## PACING

Level A All  
Level B All  
Level C All

## VOCABULARY

toothpicks, Plasticine

## MATERIALS

per group: 12 toothpicks, Plasticine,  
wire, popsicle or coffee-stir sticks,  
straws

## RELATED AIDS

HMS—DM19 to DM22.

## BACKGROUND

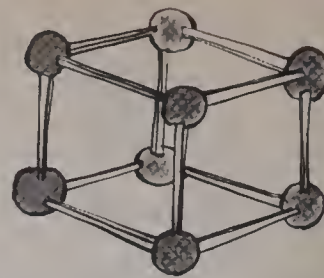
Skeleton model-making is an important step in the development of the child's spatial perceptions. Plasticine corners are easier to use than are the pipecleaner corners used later in Grade 4. The Plasticine models will be crude and rough but by using the coffee-stir sticks children can model sufficiently well. It is the process of trying to make the shape that builds in the child's mind the characteristics of the shape.

## ACTIVITIES

1. Select models the children have made to suspend from the ceiling.
2. Ask the children to work in groups to decide which shapes stack best in a box.
3. Children may practise sorting and naming the rule used by playing the "Sorting Game" as described in the Activity Reservoir.

## Let's Make Shapes

1. Use 12 toothpicks.  
Use 8 pieces of Plasticine.  
Make this skeleton cube.



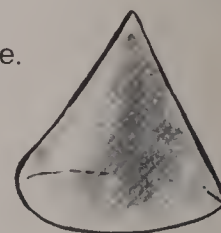
2. Make other skeleton shapes.



3. Use Plasticine.  
Make a cube.



Make a cone.

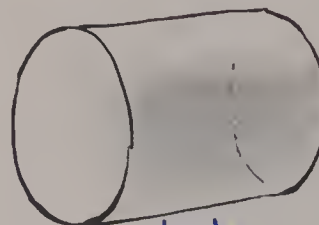


4. Make other shapes.  
Name each shape.

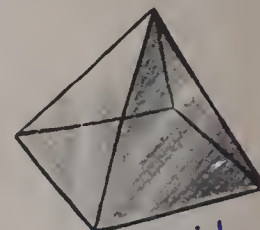
sphere



cylinder



pyramid





84 Making 3D shapes


**Using the Book** Illustrate how to use a piece of Plasticine and three sticks to make a corner for a cube. Some children will need models to serve as a pattern for their shapes. Assessment should be based on the child's recognition of the essential features of each shape reflected in each of their shapes rather than on the quality of the models. Some children will be unable to model with any dexterity yet they may have the appropriate perceptions. Discuss the features of each shape. Discuss how many toothpicks and how many pieces of Plasticine are needed for each skeleton model.


# Counting Solid Shapes

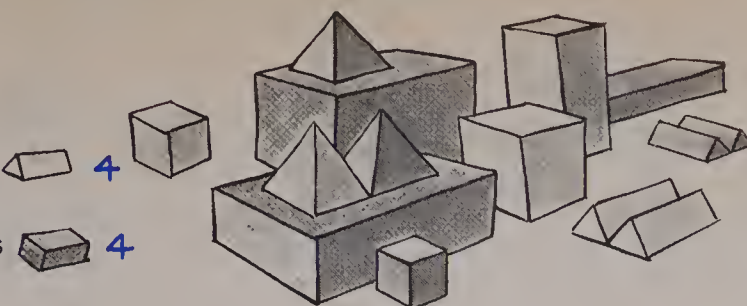
1. Count the number of

(a) pyramids  3


(b) triangular prisms  4


(c) cubes  3

(d) rectangular prisms  4

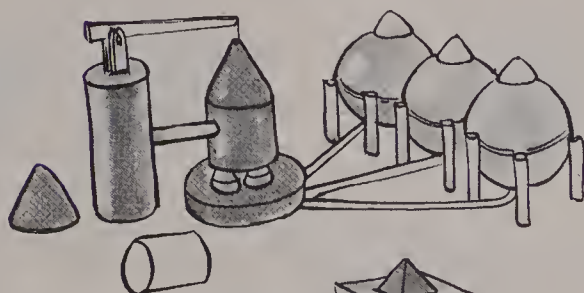


2. Count the number of


(a) cones  5


(b) cylinders  12


(c) balls  3





3. Count the number of


(a) triangular prisms  3

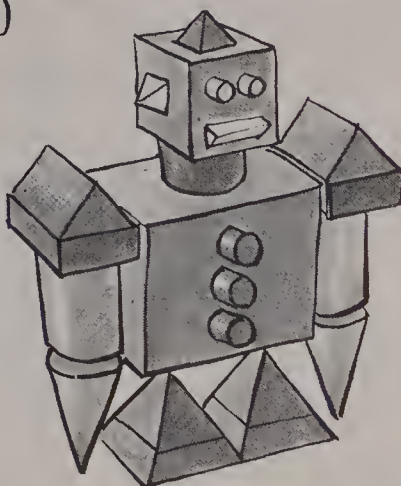
(b) pyramids  4

(c) cylinders  8

(d) cones  2

(e) rectangular prisms  2

(f) cubes  2



Recognizing 3D shapes 85

**Using the Book** Be certain that the children realize that each exercise refers to the artwork immediately to the right. Read through the exercises to be certain that children are familiar with (a) all the words on the page (b) what to do.

## OBJECTIVES

To review 3D shapes

To identify 3D shapes studied

To count the number of 3D shapes in a set

## PACING

Level A All

Level B All

Level C All

## SUGGESTIONS

**Initial Activity** Set out a collection of the shapes to be studied: (a) flat shapes (b) curved shapes.

Ask children to sort them into two sets and to name each type. Have children count the number of each kind in each set.

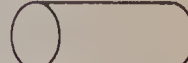
## ACTIVITIES

1. Review and practise ordering by setting out an assortment of cylinders of various sizes. Ask children to arrange them from largest to smallest.

2. Have children use large prepared patterns of the shapes illustrated to make a class Robot. Remember to have them paint it. (DM19 to DM22)

3. Put a price list up for each shape:

5¢ —



10¢ —



20¢ —



Ask, "How much is Mr. Robot worth?"

Change the prices for variety in this activity.

## OBJECTIVES

- To recognize rectangles and squares
- To draw a rectangle and a square given the corners
- To recognize rectangles (and squares) that are the same size (drawn on dot paper)

## PACING

- Level A All
- Level B All
- Level C All

## VOCABULARY

rectangle

## MATERIALS

a transparent geo-board for overhead projector or a large demonstration geo-board, student geo-boards and dot paper (DM23 and DM24)

## RELATED AIDS

HMS—DM23 and DM24.

## BACKGROUND

A square is a special rectangle. It has all sides the same length. But a rectangle is not necessarily a square. When children count rectangles they should include the squares (page 94).

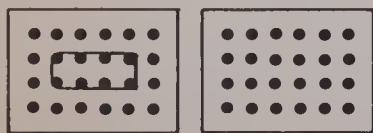
## SUGGESTIONS

**Initial Activity** Show the class your rectangle on your geo-board. Ask the children to make one like yours on their boards. Discuss the properties. Repeat this procedure for a square.

## ACTIVITIES

1. Make a rectangle or square on your geo-board. Ask the children to draw it on their dot paper. This is a difficult activity and repeated practice is needed.

2. Set up a station of 5 pairs of geo-boards. On the first of each pair make a shape. On the other a child is to make the shape shown on the first geo-board. Five different-sized shapes can be practised by the children.



3. Provide an envelope with this set of shapes:

- rectangles
- squares
- parallelograms
- triangles

Make two of each shape. Use an assortment of colours.

Instructions on the envelope:

1. Pick out the rectangles.

2. Match the rectangles of the same size.

3. Pick out the squares.

4. Match the squares of the same size.

## Rectangles



Rectangles have 4 sides  
and 4 square corners.



Square corners

A special rectangle:  
the **square**.

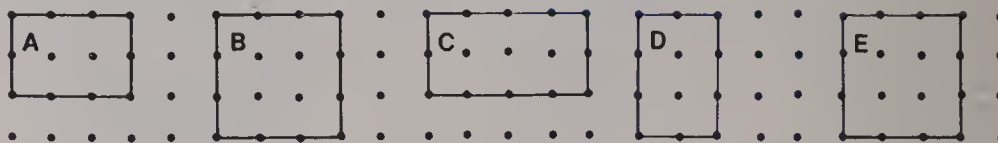
1. Trace the dots.  
Draw a rectangle.

2. Trace the dots.  
Draw a square.

3. This rectangle is 4 units long.  
How wide? **2 units**  
How many square corners? **4**

4. How long is this square? **2 units**  
How wide? **2 units**  
How many square corners? **4**

5. Which rectangles are the same size? **A and D; B and E**



**Using the Book** We use the expression “the same size” to build intuitively the concept of congruent rectangles and congruent squares.

It is important for some children that they be given only the 4 dots in each of Exercises 1 and 2 since too many dots may prove confusing at first.

Exercises 3-5 may be done orally.



# Types of Triangles

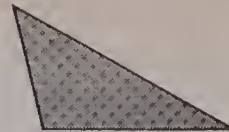
A triangle has  
3 sides  
and 3 corners.



Some have  
2 sides the  
same length.



Some have  
all 3 sides the  
same length.



Some have  
all sides of  
different lengths.

1. Which are triangles? **A, B, E**



2. Match. (1) → C; (2) → D, F; (3) → H

|     |  |   |   |   |
|-----|--|---|---|---|
| (1) |  | A | B | C |
| (2) |  | D | E | F |
| (3) |  | G | H | I |

Recognizing 3 types of triangles 87

## OBJECTIVES

To recognize triangles  
To recognize different types of  
triangles  
To recognize triangles of the same size

## PACING

Level A All  
Level B All  
Level C All

## BACKGROUND

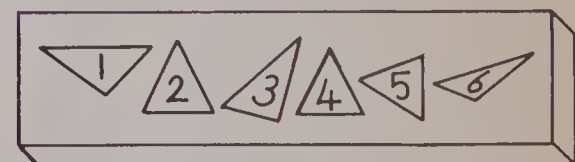
While equilateral triangles are also isosceles triangles, these exercises deal with triangles in which three sides are of the same length and *only* two sides are of the same length. This restriction is not stated specifically but is implied.

## SUGGESTIONS

**Initial Activity** Provide each group with an envelope containing a set of shapes as in Exercise 1 but with multiples of each type of triangle.  
Instructions:  
1. Sort the shapes.  
2. Match the shapes of the same size.

## ACTIVITIES

1. You may prepare from Bristol board or tag the following activity.  
Instructions: Match. 1 → F



**Using the Book** Discuss the display. Do not introduce the proper names (equilateral, isosceles, scalene).

Exercise 1 may be done orally. Ask each child to tell you why. This will provide you with information as to the child's understanding, or lack of the same.

In Exercise 2, the child may use the arrow system used on page 81, e.g., 1 → C.

2. Give each child an envelope of shapes. (See Initial Activity.) The child makes an imaginary animal using the shapes, traces the animal, and colours it. Ask each to write a short story about the animal they have made.

3. Set up a centre with large sheets of paper and magic markers. The five or six children assigned to the centre each day will look for the "shape of the day" in the classroom and trace around them on the paper. When the traced shapes have been discussed, have the children cut them out and arrange them on the floor in order of size. Discuss the order with the class.

## OBJECTIVES

To draw a triangle  
To draw triangles on geo-paper

## PACING

Level A 1-3  
Level B 1-3  
Level C 2-4

## VOCABULARY

segments

## MATERIALS

dot paper — preferably  $3 \times 3$  or  $4 \times 4$  square grid (DM23 and DM24)

## RELATED AIDS

HMS—DM23 and DM24.

## BACKGROUND

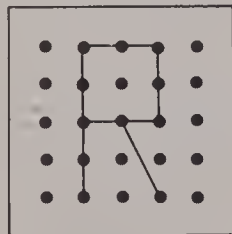
A triangle with all sides the same length *cannot* be drawn on square grid dot paper. Special triangle grid dot paper is necessary for this.

## SUGGESTIONS

**Initial Activity** Dot paper is confusing at first. Provide the children with dot paper the same size as the children's geo-boards. Ask them to make a shape on the geo-board, then draw the shape on the dot paper. Children who find this difficult can place their paper right over the geo-board.

## ACTIVITIES

1. Paint dots on your chalkboard using tempera (water soluble) paint. In your warm-up time each day, ask the children to join dots to make certain letters of the alphabet, geometric shapes, or numbers.



2. Make a pattern on a geo-board ahead of time. Have the children use other geo-boards to copy your pattern. (Each day a child can make the initial pattern.) *Extension:* Children can draw the pattern on dot paper.

3. Draw a pattern on dot paper. Ask the children to copy your pattern on (a) their geo-boards, (b) dot paper.

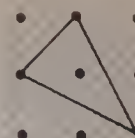
## Drawing Triangles



Make 3 points.

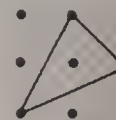


Draw segments.

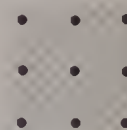


Make triangles on dot paper.

1. Draw each on dot paper



2. Use 3 by 3 dot paper.  
(a) Draw 4 different triangles.  
(b) Draw a triangle with two sides the same length.  
How many can you draw? **20**  
(c) Draw a triangle with all sides different lengths.  
How many can you draw? **40**



3. Place 3 dots anywhere on your page.  
Join them.  
What shape is formed? **a triangle**

- ★ 4. This triangle has one dot inside.  
(a) How many triangles can you draw with one dot inside? **6**  
(b) How many triangles can you draw with no dots inside? **56**



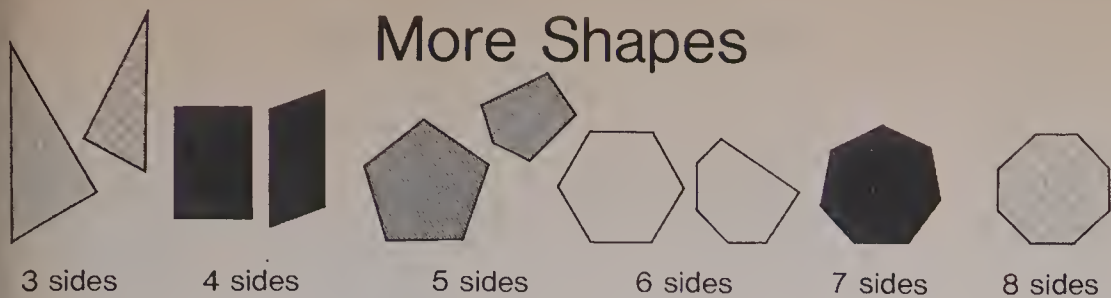
88 Drawing triangles

**Using the Book** Follow the steps indicated in the display with the children doing each of the following:

- making 3 points and drawing segments.
- choosing *any* 3 points on dot paper and joining them.

Ask children to make a triangle on their geo-board. Move about the classroom to see that the students have the "3" corners aspect. Then give them the dot paper to draw the triangle they made on their geo-board. Then assign the exercises.

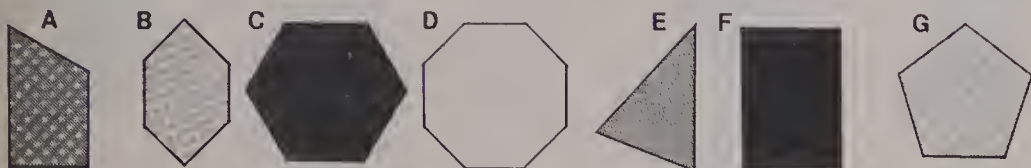
Discuss Exercise 4 using illustrations of each answer.



## More Shapes

1. How many sides?  
How many corners?

A → 4 sides  
A → 4 corners



2. Trace the heavy dots.  
Draw 6-sided shapes.



3. Trace the heavy dots.  
Draw shapes using all  
the heavy dots.



4. Use dot paper. Make different shapes.  
Name the number of sides and corners on each shape.

Recognizing polygons 89

**Using the Book** Discuss the shapes in the display by asking how many sides and how many corners on each shape. The child will likely realize the number of sides and the number of corners are the same.

You may want to clarify for some children that "heavy dots" referred to in Exercises 2 and 3 means "larger and darker" dots.

## OBJECTIVES

To recognize different polygons  
To match polygons of the same type  
To draw a polygon given the vertices

## PACING

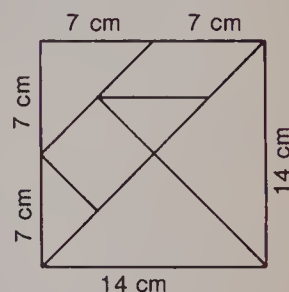
Level A All  
Level B All  
Level C All

## MATERIALS

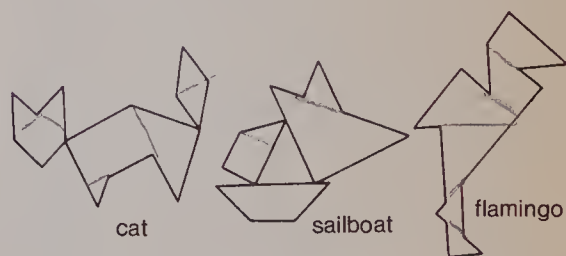
cardboard for cutouts, prepared  
tangrams, geo-boards and elastic  
bands

## ACTIVITIES

1. Prepare a tangram kit for each group of children. Store each kit in an envelope. Make each tangram from a different coloured cardboard so that parts will not get mixed up among kits.



- (a) Challenge the children to make the various shapes studied in this section.  
(b) Make a sailboat and the shapes shown below using all the parts.  
(c) Make other shapes.



2. To develop the ability to use more than one attribute at a time, have the children play "The Shape Game" in the Activity Reservoir.

3. (a) Ask the children to use their geo-boards and elastic bands to make different shapes. They may copy each shape they make onto dot paper.  
★ (b) Ask them to make squares and to count the number of nails (pins) enclosed by the elastic band. They are to discover a pattern: 4, 9, 16, etc.

## Answers:

1. B → 6 sides    C → 6 sides    D → 8 sides  
B → 6 corners    C → 6 corners    D → 8 corners  
E → 3 sides    F → 4 sides    G → 5 sides  
E → 3 corners    F → 4 corners    G → 5 corners



## OBJECTIVES

- To recognize shapes that have line symmetry
- To construct symmetrical shapes by cutting and folding

## PACING

- Level A All
- Level B All
- Level C All

## VOCABULARY

symmetry, lines of symmetry

## MATERIALS

tracing paper, regular paper, scissors

## RELATED AIDS

HMS—DM25 to DM27.

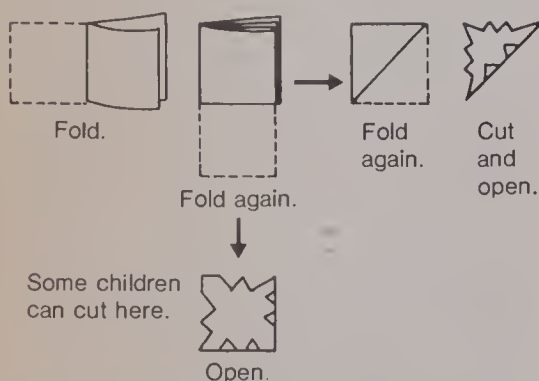
## SUGGESTIONS

**Initial Activity** Demonstrate how to fold and cut out a shape so that it opens to form a symmetrical shape with the *line of symmetry*.

## ACTIVITIES

1. Let the children cut pictures with symmetry from magazines. Encourage them to check their work by folding to see if the two halves match. They can draw the line of symmetry. The children can glue their pictures on sheets of paper, label their exhibits, and display them.

2. Show the children how to make snowflake-like patterns. (True snowflakes have exactly 3 lines of symmetry.)

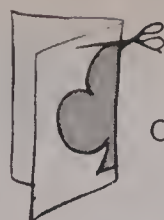
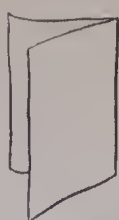


Mount patterns of flakes on black paper. (6-sided snowflakes can be made also.)

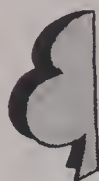
3. Obtain from your library *Once I Was a Square*, Aldridge Adele Magic Circle Press, Riverside, Connecticut. (Available in Canada from Van Nostrand Reinhold Ltd., Scarborough, Ontario.) Show and discuss the book with groups of children.

## Matching Halves

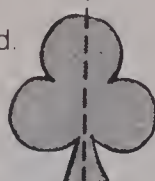
Fold paper.



Cut.



Unfold.

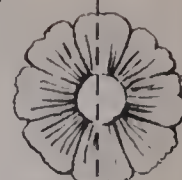
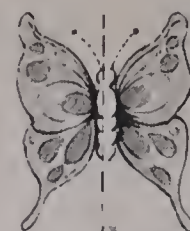


Keep cut-out part.

line of symmetry

One half matches the other half.

Examples of Symmetry



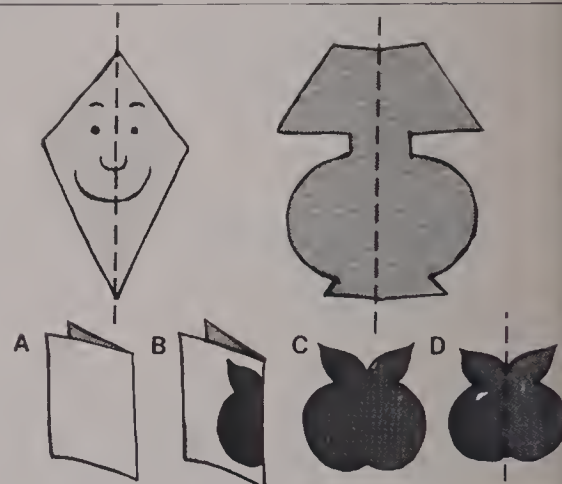
lines of symmetry



- Trace.  
Cut out.  
Fold on dotted line.  
Do the 2 parts match? *yes*

- (a) Fold a sheet of paper.  
(b) Cut out a pattern.  
(c) Unfold.  
(d) Mark the line of symmetry.

- Repeat Number 2 for other shapes.

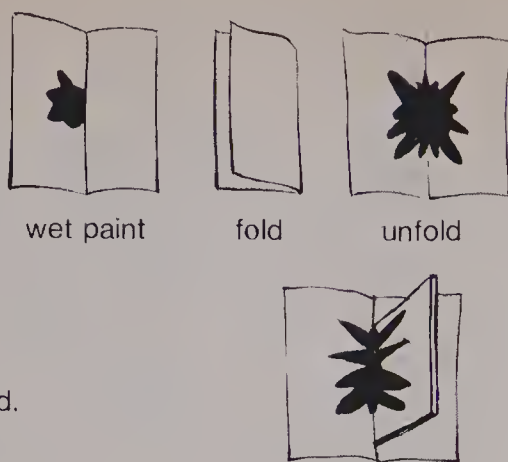


90 Line symmetry

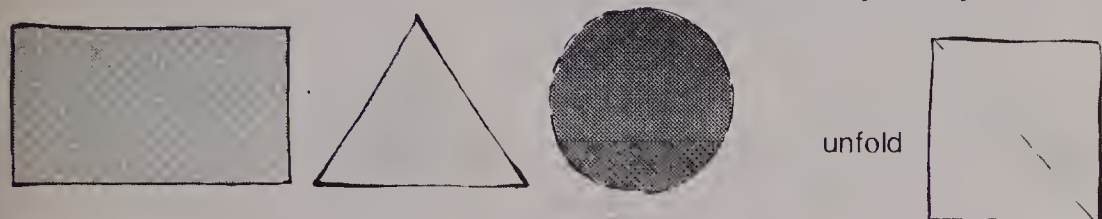
**Using the Book** Demonstrate to the children the first part of the display. It is important the children experience the making of symmetrical shapes. The children enjoy making dolls using the procedure in the display. While the children are doing this activity, discuss the "line of symmetry" with each child. Discuss the meaning of *line* of symmetry as illustrated in the second part of the display. Assign Exercises 1 and 2.

# Symmetrical Shapes

1. Make a paint-blot design.
2. Place a mirror on the pattern so half is on the page and half is in the mirror.
3. Draw a line of symmetry.
4. Repeat with different paint-blots.
5. Put your paint-blots on the bulletin board.



- Trace the square.  
Cut out.  
Fold to find lines of symmetry.  
Find as many lines of symmetry as you can.  
Use other shapes.



Lines of symmetry 91

**Using the Book** Illustrate how to make a paint-blot design. Caution children not to use too much paint. If the plastic mirror is used do not use paint of the same colour as it will not show in the reflection.

Emphasize that two halves of a symmetrical shape match each other when folded on the *line of symmetry*.

The number of "trace and cut-out" exercises is intentional in this section since these two manual skills need developing in children of this age. Children learn from doing.

Discuss how many lines of symmetry different shapes have.

## OBJECTIVES

To develop the concept of symmetry  
To draw the line of symmetry on  
symmetrical shapes — by folding

## PACING

Level A All  
Level B All  
Level C All

## VOCABULARY

symmetrical shapes

## MATERIALS

paint, paper, semi-transparent plastic  
mirrors, scissors

## RELATED AIDS

HMS—DM25 to DM27.

## ACTIVITIES

1. Challenge some children to copy a pattern on dot paper and complete it to form a symmetrical shape. Trace. Complete the matching half.



2. Have children play *Make Me Symmetric*. On dot paper a line of symmetry is drawn down the middle of a set of dots. The first player draws a segment joining 2 or more dots. The second player using a different colour draws a matching segment to form a symmetric figure. This continues until a shape is completed — it will have one line of symmetry.

3. On a geo-board, place an elastic as the line of symmetry. Using a second elastic (different colour) make a shape on one side of the line of symmetry. The child using still a different colour of elastic copies the shape to produce a symmetrical pattern.



## OBJECTIVE

To recognize three-dimensional shapes

## PACING

Level A All  
Level B All  
Level C All

## SUGGESTIONS

**Initial Activity** Encourage children to bring in shapes from the real world — not just those in the displays. This makes mathematics meaningful. Discuss the shapes.

Discuss with the class the type of work a grocery store operator does: puts goods of different shapes into boxes (good activity for children — what shapes best fit in a box?), sells goods and needs to calculate how much things cost, how much change to give the customer, etc. You may discuss shoplifting to instil proper behaviour attitudes.

The teacher may wish to take the class to a neighbourhood supermarket. The children are to identify objects or produce with the shapes discussed in this chapter. When the class returns, the children may make produce and objects from salt-flour mixture. After the mixture dries the children can paint and price the goods for a store in the corner of the classroom. Also children can bring boxes and cans for other produce. While this activity starts in shapes, it can be extended and used in lessons later on measurement (Chapter 4), capacity (Chapter 5), money (Chapter 5), and measurement (Chapter 7) — as well as in Social Studies and Science. Activities for graphing (Chapter 9) can arise from this activity in The Store.

## EXTRA PRACTICE

What is the price of the following?

1. jelly and milk
2. jelly and grapefruit
3. bread and spaghetti
4. salt and bread
- ★ 5. syrup and honey
- ★ 6. syrup and bread
- ★ 7. jelly, grapefruit, and salt
- ★ 8. salt, grapefruit, and jelly
- ★ 9. syrup, milk, and honey






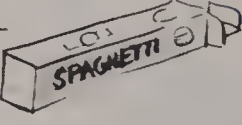






## Grocer

Henri runs a grocery store.



1. Name the shapes: jelly box, grapefruit, bread, signs, syrup.
2. What other shapes might Henri have in the grocery store?

What is the price of the following?

|    |  |     |      |   |         |
|----|--|-----|------|---|---------|
| 3. |  +      | 97¢ | 4.   |  +      | 73¢     |
| 5. |  +    | 65¢ | 6.   |  +    | 86¢     |
| 7. |  +  | 89¢ | ★ 8. |  +  | \$ 1.06 |

92 Recognizing 3D shapes

**Using the Book** Complete Exercises 1 and 2 orally. Have the children show their work for Exercises 3-8. You may wish to clarify that, in the display, grapefruits are 21¢ each.

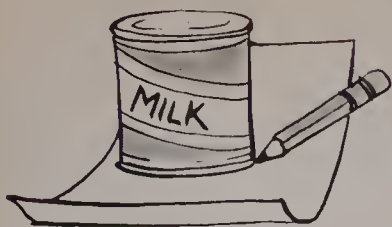
### Answers:

1. jelly box, rectangular prism; grapefruit, ball (sphere); bread, rectangular prism; signs, rectangles; syrup, cylinder.

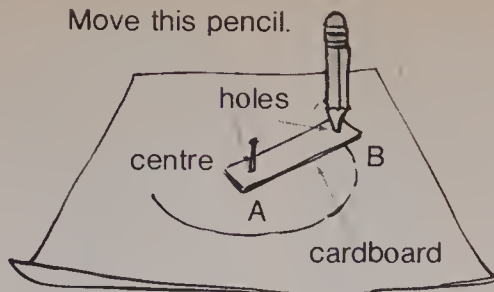


# Circles

Ways to draw circles.



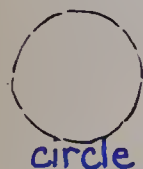
Move this pencil.



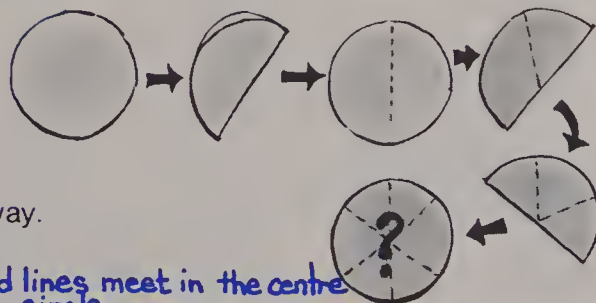
1. Use a round can. Trace a circle. Repeat with different size cans.
2. Draw a circle using one other method. Repeat for a different size circle.



3. Pick the circles.



4. (a) Draw a circle.  
(b) Cut out.  
(c) Fold to match.  
(d) Unfold. Fold a different way.  
(e) Repeat.  
(f) What did you find?



The fold lines meet in the centre of the circle.

Circle and symmetry 93

**Using the Book** Many children can handle this page with little if any explanation. Others will need demonstrations of how to use the cardboard strip to make circles.

Emphasize that the fold lines (*diameters* to teachers) in Exercise 4 cross each other at the centre of the circle and on lines of symmetry. This point arises repeatedly in exercises in subsequent grades.

## OBJECTIVES

To identify circles  
To trace circles using various methods  
To fold circles to match halves

## PACING

Level A All  
Level B All  
Level C All

## VOCABULARY

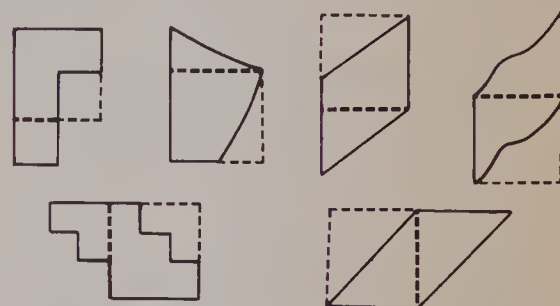
circle, repeat

## MATERIALS

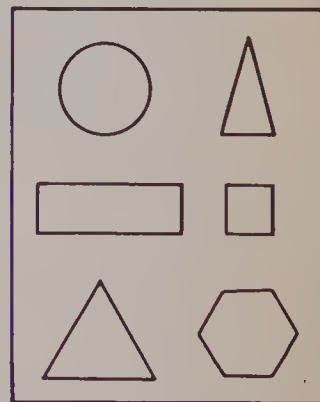
various round tin cans, cardboard strips of various lengths, different kinds of paper, scissors

## ACTIVITIES

1. Direct the children to find examples of circles in magazines and newspapers. Each child should select one, mount it with the name of what it is, and display it on the bulletin board.
2. Provide the child with large copies of these shapes. The child is to cut along the dotted line, then rearrange the pieces to form a square. The first to make 3 squares is the winner.



3. Make up a dittoed sheet similar to that shown. Children are to draw on each shape some lines of symmetry.



## OBJECTIVES

To identify circles, triangles, rectangles, and squares  
To count shapes in a pattern  
To review adding money

## PACING

Level A 1-2  
Level B All  
Level C All

## RELATED AIDS

HMS—DM28.

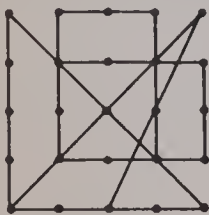
## ACTIVITIES

1. Ask the child to make a list of things in the home that are shaped like rectangles (then squares, circles, triangles).
2. Provide the children with cardboard shapes for tracing. The shapes should be all those discussed to date and several of each of different sizes. The children are to use the shapes to make pictures of objects, animals, birds, etc. They should colour and name their pictures.
3. To develop in the children the ability to use multiple attributes, have the children play "The Shape Game" in the Activity Reservoir.

## EXTRA PRACTICE

1. Have a *Count The Shapes* puzzle. Prepare a large chart or geo-board with geometric shapes.  
1 point for each triangle.  
2 points for each rectangle.  
3 points for each square.  
Who can get the most points?

*Example*



2. HMS—DM28.

## Counting Shapes

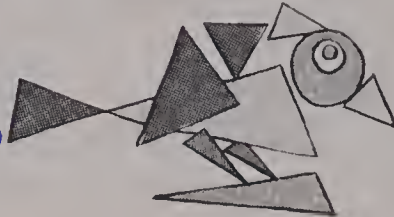
5 circles  
6 triangles  
4 rectangles  
2 squares



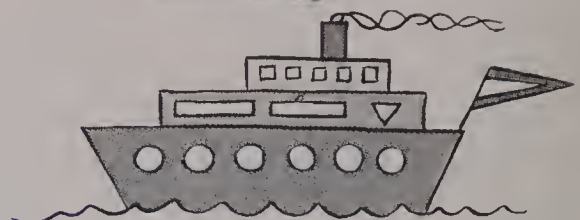
Your clue for the day:

Remember! Squares are rectangles.

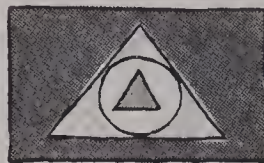
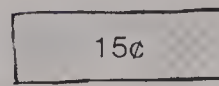
1. Count the number of  
(a) circles **3**  
(b) triangles **9**  
(c) four-sided shapes **0**



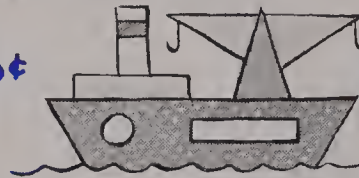
2. Count the number of  
(a) triangles **3**  
(b) circles **6**  
(c) rectangles **10**  
(d) squares **5**



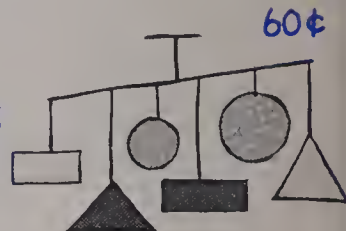
3. What is the value of each picture?



**35¢**



**\$1.15**



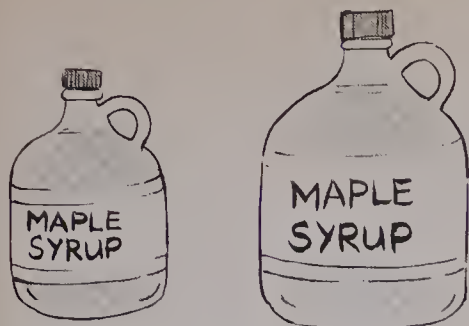
**60¢**

94 Counting shapes

**Using the Book** Children should have no problems here but if some still do, do not include the squares with the rectangles; review with them the properties of the two sets as described in the Background and display on page 86.



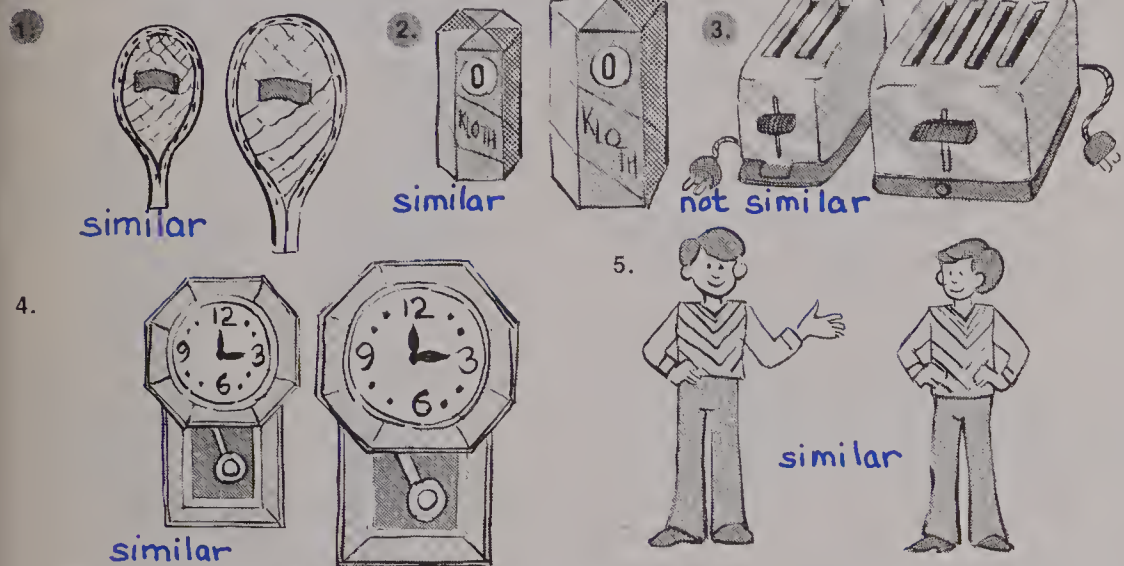
# Little Shapes and Big Shapes



These bottles have the same shape.  
They are different sizes.  
They are **similar**.

These bottles are not the same shape.  
They are *not* similar.

Which are similar shapes?



Similar:tv 95

**Using the Book** Discuss similar shapes and those which are not similar. Do this page orally asking the children why they have said the shapes are similar (they are the same shape and they are different sizes (or equal), or why they are not similar (they are shaped differently — they do not have the same shape). Discuss other examples with either real objects or pictures of items, some similar and some not.

## OBJECTIVE

To recognize similar shapes and those that are not similar

## PACING

Level A All  
Level B All  
Level C All

## VOCABULARY

bottles, similar

## MATERIALS

Collect and display several sets of shapes which are similar such as ketchup bottles, salad dressing bottles, and so on.

## ACTIVITIES

1. Ask the children to collect pictures of objects that are similar. A display of pictures appropriately titled should be made.

2. Ask the children to untangle this list of words. (Answers are in brackets.)

|            |              |
|------------|--------------|
| celric     | (circle)     |
| buce       | (cube)       |
| noce       | (cone)       |
| miprs      | (prism)      |
| dilso      | (solid)      |
| raque      | (square)     |
| metysyrm   | (symmetry)   |
| lsyimitari | (similarity) |
| tecrangel  | (rectangle)  |
| dimpary    | (pyramid)    |
| dinycler   | (cylinder)   |
| trelgani   | (triangle)   |

3. Provide the children with two envelopes each containing pairs of cards with similar shapes or pictures. Two children each take an envelope and race to see who can match the similar shapes first. Players are to check each other's pairs.

## EXTRA PRACTICE

Add.

|   |   |   |
|---|---|---|
| $\begin{array}{r} 231 \\ + 324 \\ \hline \end{array}$ | $\begin{array}{r} 456 \\ + 543 \\ \hline \end{array}$ | $\begin{array}{r} 232 \\ + 101 \\ \hline \end{array}$ |
| $\begin{array}{r} 236 \\ + 164 \\ \hline \end{array}$ | $\begin{array}{r} 476 \\ + 324 \\ \hline \end{array}$ | $\begin{array}{r} 165 \\ + 235 \\ \hline \end{array}$ |
| $\begin{array}{r} 259 \\ + 43 \\ \hline \end{array}$  | $\begin{array}{r} 207 \\ + 196 \\ \hline \end{array}$ | $\begin{array}{r} 50 \\ + 254 \\ \hline \end{array}$  |
| $\begin{array}{r} 632 \\ + 23 \\ \hline \end{array}$  | $\begin{array}{r} 471 \\ + 62 \\ \hline \end{array}$  | $\begin{array}{r} 323 \\ + 99 \\ \hline \end{array}$  |
| $\begin{array}{r} 739 \\ + 260 \\ \hline \end{array}$ | $\begin{array}{r} 325 \\ + 563 \\ \hline \end{array}$ | $\begin{array}{r} 198 \\ + 579 \\ \hline \end{array}$ |
| $\begin{array}{r} 398 \\ + 278 \\ \hline \end{array}$ | $\begin{array}{r} 377 \\ + 577 \\ \hline \end{array}$ | $\begin{array}{r} 389 \\ + 176 \\ \hline \end{array}$ |



## OBJECTIVES

- To recognize the rule used to sort simple sets of objects
- To use a rule to sort a simple set of objects into at least two subsets

## PACING

- Level A 1-5
- Level B 1-5
- Level C All

## VOCABULARY

sorting, rule

## RELATED AIDS

HMS—DM29.

## BACKGROUND

In the Initial Activities suggested for pages 82, 85, and 87, sorting skills were being developed.

Sorting is a very important process that is used in all subjects. In mathematics at this grade level, concrete objects are sorted to develop this process.

## SUGGESTIONS

**Initial Activity** If the sorting suggestions for pages 82, 85, and 87 have not been done, then a set of shapes from the displays on pages 81 and 82 should be sorted into two sets: (1) all flat surfaces, (2) others. Discuss why each is put into the pile it is.

## ACTIVITIES

1. Prepare an assignment card with a set of objects such as washers, nuts, bolts, screws, and so forth.

1. Sort the objects into TWO piles.
2. Write the rules you used.
3. Describe the objects in each set according to the rules.

2. Direct the children to "The Sorting Game" described in the Activity Reservoir.

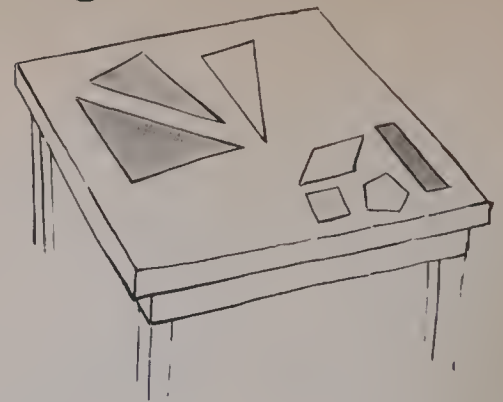
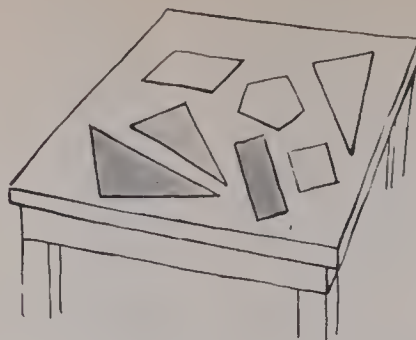
3. Write each of the digits 0, 1, 2, ..., 9 on cards. Ask the children to sort them into two piles using a rule. The child is to write the rule used under the two piles.

**Example**

- (a) Numbers with straight lines only.  
Numbers with curved lines.
- (b) Numbers with circles.  
Numbers without circles.

## Sorting

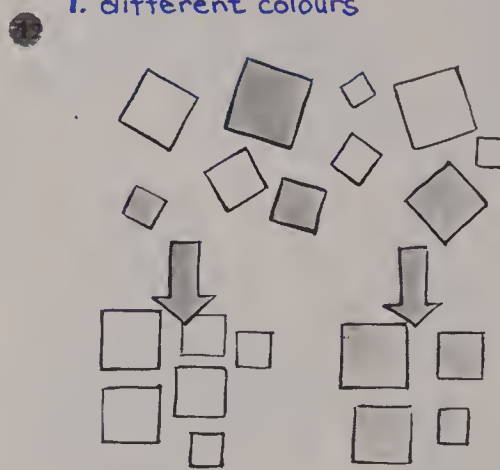
John sorted the shapes.



John used this sorting rule: Triangles in one pile.  
Others in another pile.

What is the rule?

1. different colours



2. Shoes with ties in one pile. Shoes without ties in another pile.



96 Sorting sets of objects into subsets

**Using the Book** Start with the set of shapes (large) shown in the display. Working on the floor with the others watching, ask a pupil to make two piles using some rule. After sorting, the child tells the rule used. If no one uses the rule in the display, give the rule and ask a child to sort according to your rule.

**Example** all square corners — no square corners  
only 4 sides — others

Stress the idea that sorting requires that one or more rules be used. These rules help to identify the properties of the things sorted.

While the children will be able to do the exercises from these pages, it is preferable to provide them with different sets of objects to sort, discussing the rules used. Then culminate by doing the exercises orally. After the rule has been discovered and stated for each sorting, ask what other rules could be used to sort the set being discussed.

## EXTRA PRACTICE

1. Subtract. Look for patterns.

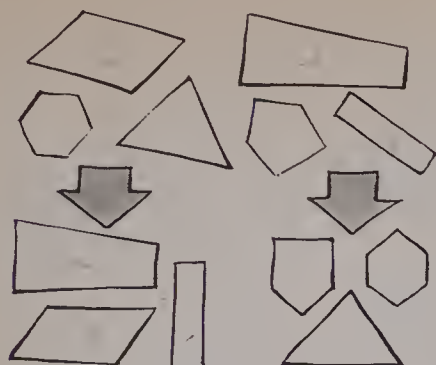
|       |       |       |
|-------|-------|-------|
| 698   | 897   | 965   |
| - 365 | - 453 | - 410 |
| 942   | 880   | 938   |
| - 336 | - 678 | - 231 |
| 669   | 860   | 961   |
| - 236 | - 27  | - 28  |

|       |       |       |
|-------|-------|-------|
| 721   | 811   | 900   |
| - 289 | - 157 | - 135 |
| 890   | 900   | 800   |
| - 101 | - 222 | - 233 |
| 600   | 800   | 900   |
| - 277 | - 255 | - 244 |

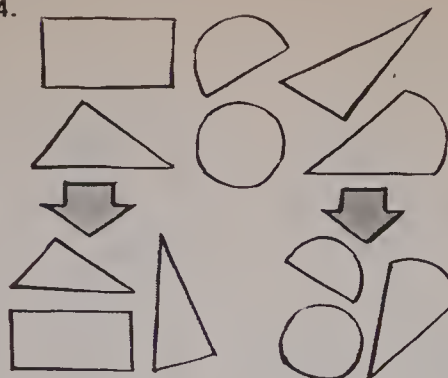
2. HMS—DM29.

What is the rule?

3.



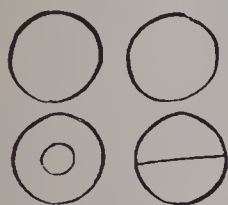
4.



5. Name a rule for sorting. *Answers will vary.*



★ 6. Mary sorted these circles.



Rule: White circles in one set.

Coloured circles in the other set.

Is this a good rule? Why?

### BRAIN CHALLENGER

Use the digits 1, 3, and 5.

How many 3-digit numbers can you make? *6*

(a) Which is the largest number? *531*

(b) Which is the smallest number? *135*

### Answers:

1. 4-sided shapes in one pile. Others in another pile.
2. Shapes with straight sides in one pile. Others in another pile.
3. No. Two of the circles are both white and coloured.

## OBJECTIVE

To evaluate achievement of the chapter objectives

## PACING


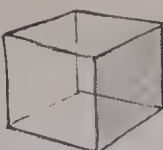
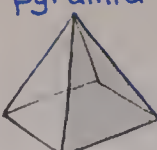


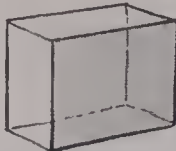
Level A All  
Level B All  
Level C All

## RELATED AIDS

HMS—DM1 and DM30.



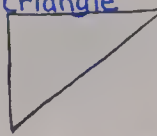

## Chapter Test

1. Name the shapes.

A  B  C  D  E  F 

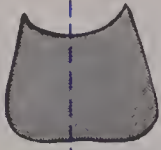
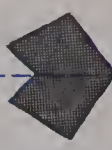

cube  
pyramid  
cylinder  
triangular prism  
rectangular prism  
cone

2. Name the shapes.

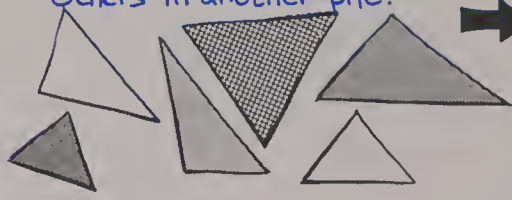
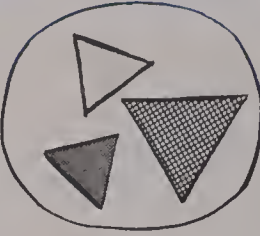
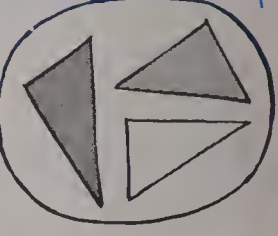
A  B  C  D 

square  
circle  
triangle  
rectangle

3. Trace each. Draw a line of symmetry on each.

4. Name the rule for sorting. Triangles with all sides the same length in one pile. Others in another pile.

98 Chapter 3 test

**Using the Book** Each child should do this test independently under supervision. Assistance should be given only when the instructions are not understood. After the work has been corrected, you should provide appropriate remedial work. You may wish to reteach if a large number of children had difficulty with a particular topic or concept.

The following chart will help in this regard. The specific objectives are listed in the Chapter Overview (see page 80).

An alternate Chapter Test can be found in the Holt Mathematics System Duplicating Masters available for use with this grade level.

| Test Item | Objective | Text Page Number |
|-----------|-----------|------------------|
| 1         | A         | 81, 82           |
| 2         | B         | 86, 87, 93       |
| 3         | C         | 90, 91, 95       |
| 4         | D         | 96               |



# Cumulative Review

## OBJECTIVE

To review and test selected concepts and skills previously covered

Add.

- |  |  |  |  |   |
|--|--|--|--|---|
| 1. $\begin{array}{r} 50 \\ + 8 \\ \hline 58 \end{array}$     | 2. $\begin{array}{r} 63 \\ + 15 \\ \hline 78 \end{array}$    | 3. $\begin{array}{r} 23 \\ + 57 \\ \hline 80 \end{array}$    | 4. $\begin{array}{r} 38 \\ + 40 \\ \hline 78 \end{array}$    | 5. $\begin{array}{r} 26 \\ + 47 \\ \hline 73 \end{array}$     |
| 6. $\begin{array}{r} 413 \\ + 376 \\ \hline 789 \end{array}$ | 7. $\begin{array}{r} 140 \\ + 409 \\ \hline 549 \end{array}$ | 8. $\begin{array}{r} 514 \\ + 237 \\ \hline 751 \end{array}$ | 9. $\begin{array}{r} 606 \\ + 209 \\ \hline 815 \end{array}$ | 10. $\begin{array}{r} 389 \\ + 154 \\ \hline 543 \end{array}$ |

Subtract.

- |   |   |   |   |   |
|---|---|---|---|---|
| 11. $\begin{array}{r} 15 \\ - 8 \\ \hline 7 \end{array}$      | 12. $\begin{array}{r} 27 \\ - 7 \\ \hline 20 \end{array}$     | 13. $\begin{array}{r} 36 \\ - 14 \\ \hline 22 \end{array}$    | 14. $\begin{array}{r} 68 \\ - 26 \\ \hline 42 \end{array}$    | 15. $\begin{array}{r} 44 \\ - 17 \\ \hline 27 \end{array}$    |
| 16. $\begin{array}{r} 489 \\ - 154 \\ \hline 335 \end{array}$ | 17. $\begin{array}{r} 538 \\ - 263 \\ \hline 275 \end{array}$ | 18. $\begin{array}{r} 608 \\ - 302 \\ \hline 306 \end{array}$ | 19. $\begin{array}{r} 802 \\ - 136 \\ \hline 666 \end{array}$ | 20. $\begin{array}{r} 823 \\ - 476 \\ \hline 347 \end{array}$ |

Copy and complete using  $>$ ,  $<$ , or  $=$ .

21.  $36 \bullet 63 <$       22.  $156 \bullet 211 <$       23.  $989 \bullet 989 =$

Copy and complete.

24.  $45 = \blacksquare$  tens and  $\blacktriangle$  ones      25.  $308 = \blacksquare$  hundreds,  $\blacktriangle$  tens, and  $\blacktriangledown$  ones

26. 3rd, 4th, 5th,  $\blacksquare$ ,  $\blacksquare$ ,  $\blacksquare$ ,  $\blacksquare$ ,  $\blacksquare$ .  
6th, 7th, 8th, 9th, 10th.

27. What is the rule?  
Triangles in one pile.  
Others in another pile.



Chapters 1-3 cumulative review 99

**Using the Book** This page may be used for diagnostic and remedial as well as review purposes. Children should check their work, correct any errors, and review the pages that contain any problems of the type they missed. Some children can do this on their own while others may need help. If a large number of children have a particular problem incorrect, you may want to reteach that topic to the groups, then assign a duplicated worksheet to reinforce that topic or refer to an appropriate skill card in the BFA Computational Skills Kit I.

| Test Item | Text Page Number |
|-----------|------------------|
| 1-4       | 39-40            |
| 5         | 47               |
| 6-7       | 44               |
| 8-10      | 50-53            |
| 11-15     | 56-63            |
| 16        | 64               |
| 17-18     | 67               |
| 19-20     | 70               |
| 21        | 7                |
| 22-23     | 43               |
| 24-25     | 42               |
| 26        | 11               |
| 27        | 96-97            |

# CHAPTER 4 OVERVIEW

This chapter extends place value to thousands, extends addition to four-digit sums, reinforces units of length and mass, and introduces rounding.

## OBJECTIVES

- A To add two three-digit numbers with four-digit sums
- B To estimate and measure lengths in centimetres and metres and to solve problems involving kilometres
- C To estimate the mass of certain objects and to round readings on scales to the nearest one unit and nearest ten units (grams and kilograms)

## BACKGROUND

Our base-ten system of numeration uses ten basic digits: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9. They are used with our place-value system.

| thousands | hundreds | tens | ones |
|-----------|----------|------|------|
| 7         | 3        | 2    | 4    |

The value of each digit in the chart is determined by the value of that digit *and* its place value:

$$\begin{array}{l} 7 \text{ means } 7 \times 1000 = 7000 \\ 3 \text{ means } 3 \times 100 = 300 \\ 2 \text{ means } 2 \times 10 = 20 \\ 4 \text{ means } 4 \times 1 = 4 \\ \hline 7324 \end{array}$$

In rounding numbers at this grade level we use “Is it closer to \_\_\_ or to \_\_\_?” The two blanks are the lower and higher unit to which we might round. For example, “Is it closer to 5 kg or to 6 kg?” when rounding to the nearest one kilogram and “Is it closer to 30 cm or 40 cm?” when rounding to the nearest ten centimetres. Note: Do not at this time use the midway case such as 35 or 6.5. If this case arises, you may give the rule that we will “round up”. That is, 35 becomes 40 and 6.5 becomes 7.

Measurement is emphasized through an “estimate, then measure” approach.

## MATERIALS

- place-value chart (See page 104.)
- rulers or tapes in centimetres and metres
- cord
- newspapers, glue, and tape
- scales in grams and kilograms
- objects of various masses

## CAREER AWARENESS

### Carpenters [17]

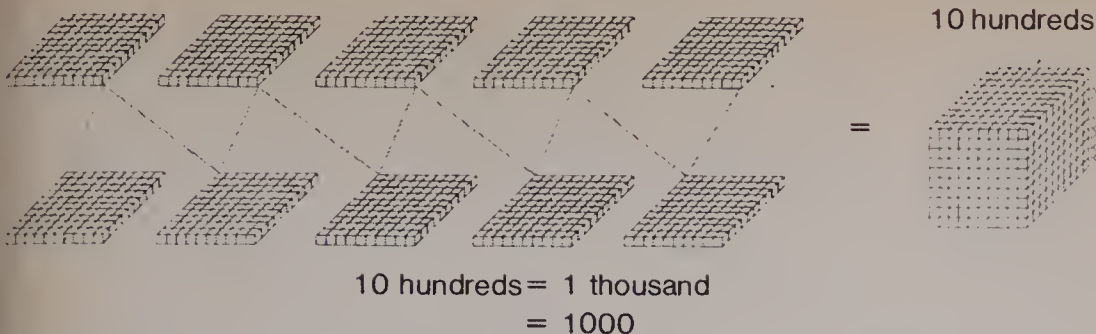
Carpenters are involved in the building industry. They are responsible for the construction of part or all of a building. They work with wood basically but other materials such as glass, metal, and cement are involved in today’s building industry. Because many components are precut and preassembled and, in some cases prefinished, carpenters today are more often involved in assembling the preassembled units.

A carpenter’s work is often very exacting. It requires accurate calculations and measurements, cuttings, and fittings. Carpenters may be involved in the various stages in building a house: putting in forms for the cement foundation, framing the house, shingling and putting on siding, and putting in doors and windows. Some carpenters may build and install cupboards, counters, and finish the woodwork.

Good physical fitness is important because the job can be strenuous and at times dangerous. Depending on the type of work, carpenters may be required to work in all types of weather.

Carpenters require training usually in a technical institute, followed by several years as an apprentice. They need to be self-reliant because the nature of the work requires good judgment on their part. Carpenters may be self-employed or may work for contractors.

# Thousands



## OBJECTIVE

To write ten 100's as 1000

## PACING

Level A All  
Level B All  
Level C All

## MATERIALS

a set of blocks consisting of ones or unit cubes (small), longs (10 cubes), flats (10 longs), and a 1000 cube

## BACKGROUND

Since 1000 objects are rather unwieldy, the large cube is best used to represent 1000.

## SUGGESTIONS

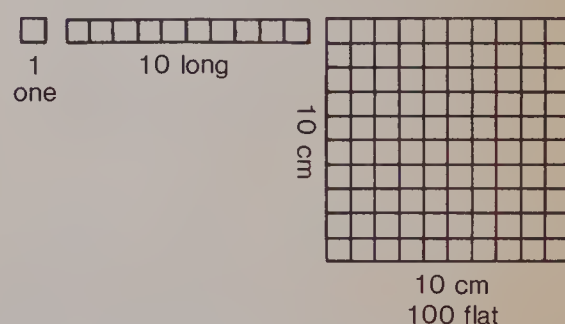
**Initial Activity** Develop the idea that:

10 ones = 1 long  
↓  
10 ones = 10  
↓  
10 longs = 1 flat  
↓  
10 10's = 100  
↓  
10 flats = 1 large cube  
↓  
10 100's = 1000.

Let the child make a 1000 cube in as many different ways as time permits, i.e., 8 flats, 18 longs, 20 ones; 9 flats, 9 longs, 10 ones; etc.

## ACTIVITIES

1. If the blocks described are not available, provide the children with cardboard cutouts of centimetre squared grid paper in these shapes:



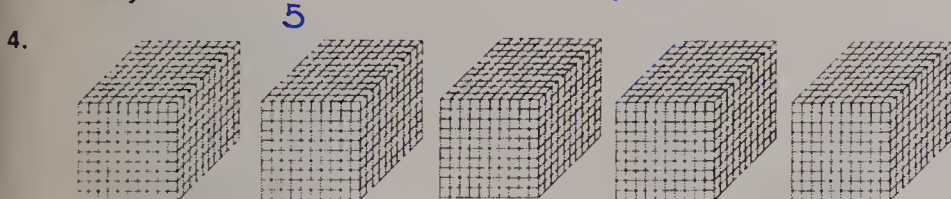
Use the blocks or the cardboard cutouts. Ask a child to show 8 hundreds; 9 hundreds; 10 hundreds. Ask what another name for 10 hundreds is. If difficulties still persist, go back and have the children count out 8 ones; 9 ones; 10 ones. What is another name for 10 ones? (10) Then have child count out 8 tens; 9 tens; 10 tens. What is another name for 10 tens? (100) Now repeat the 8 hundreds, 9 hundreds, etc.

2. Have groups of children make 2000. Then ask how many hundreds are in 2000. Repeat for 3, 4, 5, ... 9 thousands.

Which of these show one thousand? Write the number for each. Questions 2 and 3.



How many thousands? Write the number. 5000



Thousands 101

**Using the Book** Discuss the display. Emphasize, or better yet demonstrate, that when 10 flats are stacked on top of each other they make a cube.

Do the exercises orally. You may ask the children to write the answers in their books as each question is discussed.



## OBJECTIVE

To write the value of each digit in four-digit numbers

## PACING

Level A All  
Level B All  
Level C All

## MATERIALS

set of blocks, a place-value chart and a set of number cards

## RELATED AIDS

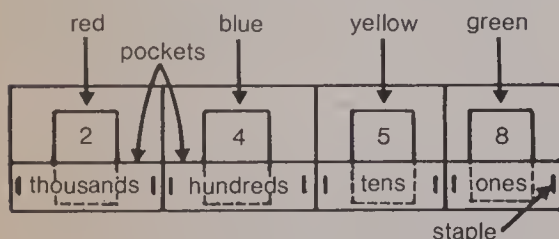
HMS—DM31.

## BACKGROUND

Our base 10 numeration system uses the ten digits 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 and the place-value system going left from the units (ones) to tens, hundreds, thousands, and so on. Each next place is obtained by multiplying the value of the place to the right by 10.

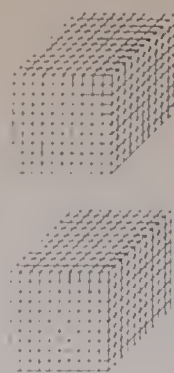
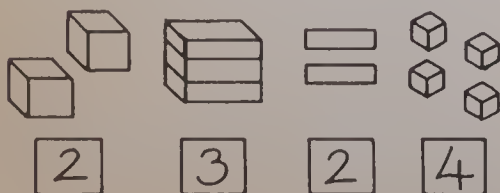
## SUGGESTIONS

**Initial Activity** Explain that 1000 is 1 thousand, 0 hundreds, 0 tens, and 0 ones. Then discuss such numbers as 2437 as 2 thousands (set out 2 blocks), 4 hundreds (set out 4 flats), 3 tens (set out 3 longs), and 7 ones (set out 7 ones). Write the number on the chalkboard. Read it aloud. Using the place-value chart (DM31), put number cards in the pockets and ask the children to (a) read the number aloud, and (b) write the number. Remind the children that 0 is a placeholder and when a pocket is empty the child writes 0 in that place in the number.



## ACTIVITIES

1. Ask a child to set out an arrangement of blocks as illustrated.



## Writing Thousands

| thousands | hundreds | tens | ones |
|-----------|----------|------|------|
| 2         | 4        | 5    | 8    |

2 thousands 4 hundreds 5 tens 8 ones

2458

Copy the charts and write the numbers.

1.

| thousands | hundreds | tens | ones |
|-----------|----------|------|------|
| 3         | 2        | 4    | 6    |

3246

2.

| thousands | hundreds | tens | ones |
|-----------|----------|------|------|
| 8         | 5        | 9    | 9    |

8599

3.

| thousands | hundreds | tens | ones |
|-----------|----------|------|------|
| 6         | 1        | 4    | 1    |

6141

4.

| thousands | hundreds | tens | ones |
|-----------|----------|------|------|
| 2         | 0        | 5    | 6    |

2056

102 Place value - 4 digits

**Using the Book** Discuss the display. Ask, "Why do we write 2 in the first box?, 4 in the second?, and so on. (because there are 2 thousands, etc.?) Then indicate we do not always want to have to draw the place-value chart every time. Therefore, we agree the place values will be remembered and understood and so we can just write 2458. You may wish to do the exercises as a class exercise with some children writing the numbers on the chalkboard.

3. What does the 3 mean in:

③ 4 2 7

1 2 ③ 4

2 ③ 5 6

4 6 5 ③ ?

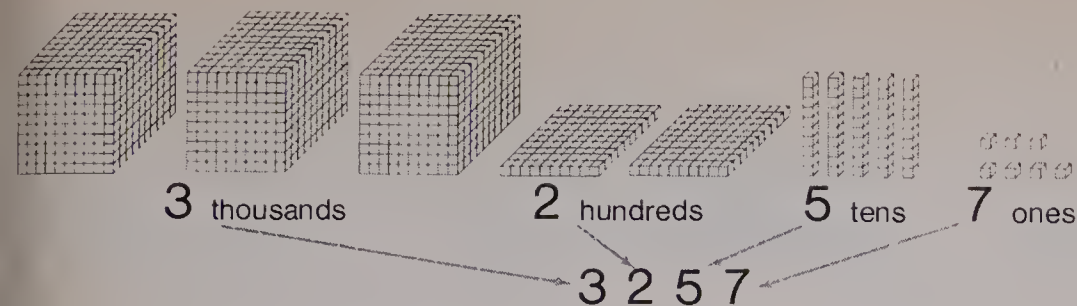
Ask another to put number cards beside each pile. Ask a third child to read aloud the number. Repeat for other arrangements.

2. *Extension.* Provide the children with riddles of this type.

My one's digit is between 1 and 3.  
My ten's digit is 4 times my one's digit.  
My hundred's digit is between 4 and 6.  
My thousand's digit is 1 less than 9.  
Who am I? (8582)

Have the children make up a set of riddle cards for independent use.

# How Many?



How many thousands in 3257? **3**      How many tens in 3257? **5**  
 How many hundreds in 3257? **2**      How many ones in 3257? **7**

How many thousands?

1. 6000 **6**      2. 4000 **4**      3. 3571 **3**      4. 9876 **9**

How many hundreds?

5. 2300 **3**      6. 1500 **5**      7. 2543 **5**      8. 3649 **6**

Write the numerals.

9. 6 thousands 4 hundreds 2 tens 4 ones **6424**  
 10. 3 thousands 0 hundreds 6 tens 7 ones **3067**  
 11. 9 thousands 1 hundred 3 tens 2 ones **9132**  
 12. 2 thousands 7 hundreds 0 tens 1 one **2701**  
 13. 7 thousands 2 hundreds 4 tens 0 ones **7240**  
 14. 4 thousands 0 hundreds 1 ten 8 ones **4018**  
 15. 6 thousands 0 hundreds 0 tens 3 ones **6003**

4-digit numerals 103

**Using the Book** Review the display orally. Do Exercises 1-8 orally. You may wish to remind children that the answer to Exercise 10 is in the back of the book.

## OBJECTIVE

To write standard numerals given the place-value names

## PACING

Level A 1-12  
 Level B All  
 Level C All

## MATERIALS

set of blocks, place-value chart and number cards described on previous page

## SUGGESTIONS

**Initial Activity** Using the place-value chart and number cards, make up numbers as in the display. Ask questions such as: "How many thousands in this number?" "How many hundreds in the hundred's place?" Then cover up the words leaving only the number cards. Ask the questions again.

In this exercise we are emphasizing place value. Hence when it asks for "how many hundreds?" it is the number in the hundred's place that is wanted. This should be explained if the child wants to answer "15 hundreds in 1500". Explain that 15 is correct but we want the number in the hundred's place.

## ACTIVITIES

1. Make a matching game. Put four-digit numerals on cards of one colour and the expanded form on cards of another colour. Children are to match.  
*Example*

|      |  |
|------|--|
| 7285 | 7 thousands, 2 hundreds,<br>8 tens, 5 ones |
|------|--|

2. Provide each child with 4 cards from a set of number cards. Tell each child to arrange the cards in any order, then to copy each numeral and read it aloud in expanded form.

3. Provide exercises of this type.
- (a) Put a 3 in the ten's place.  
 Put a 2 in the thousand's place.  
 Put a 9 in the hundred's place.  
 Put a 6 in the one's place.
- (b) Put a 0 in the hundred's place.  
 Put a 9 in the one's place.  
 Put a 3 in the thousand's place.  
 Put a 7 in the ten's place.

4. Use the "Place-Value Game" in the Activity Reservoir.



OBJECTIVE

To give the place and give the value of any digit in a four-digit numeral

PACING

- Level A 1-6, 9-17
- Level B All
- Level C All

MATERIALS

place-value chart, cardboard strips or popsicle sticks

RELATED AIDS

HMS—DM31 and DM32.

SUGGESTIONS

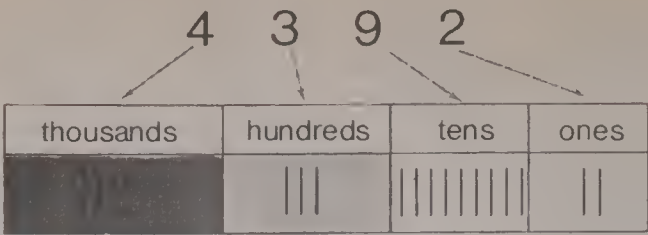
**Initial Activity** Ask a child to put the necessary number of sticks in the correct pockets of the place-value chart to indicate (a) 3000, (b) 3100, (c) 3140, (d) 3145. (Read these numbers — do not write them since the last two digits are not read “four tens five ones” but rather as “forty-five”.) This point is to be made repeatedly in the oral introduction of this lesson. Continue this activity until the children have confidence. Ask the children to write each numeral represented by the sticks in the place-value chart. (The writing of the numbers in words comes later.)

ACTIVITIES

1. Make up another matching game similar to the one described in Activity 1, page 103, but use the written name in place of the expanded notation.
2. Provide the child with this puzzle:

|     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|     |     |     | a 3 | b 1 | c 2 | d 9 |     |     |     |
|     |     |     | e 4 | 0   | 0   | 3   |     |     |     |
|     |     |     | f 1 | 4   | 0   | 3   |     |     |     |
|     | g 6 | h 7 | 0   |     |     |     | i 2 | j 4 | k 7 |
| l 8 | 1   | 3   |     |     |     |     |     | n 5 | 1   |
| o 4 | 2   | 1   |     |     |     |     |     | p 6 | 0   |
| q 7 | 9   | 3   | r 4 |     |     |     | s 9 | 2   | 5   |
|     |     |     | t 4 | u 1 | v 1 | 2   |     |     |     |
|     |     |     | w 7 | 0   | 1   | 4   |     |     |     |
|     |     |     | x 6 | 3   | 0   | 0   |     |     |     |

Names of Numbers



4392 = 4 thousands 3 hundreds 9 tens 2 ones  
4392 = four thousand, three hundred ninety-two

Copy and complete.

1. 4371 = 4 thousands 3 hundreds 7 tens 1 ones
2. 1725 = 1 thousands 7 hundreds 2 tens 5 ones
3. 8143 = 8 thousands 1 hundreds 4 tens 3 ones
4. 2520 = 2 thousands 5 hundreds 2 tens 0 ones
5. 3215 = 3 thousands 2 hundreds 1 tens 5 ones
6. 8094 = 8 thousands 0 hundreds 9 tens 4 ones
7. 6708 = 6 thousands 7 hundreds 0 tens 8 ones
8. 5220 = 5 thousands 2 hundreds 2 tens 0 ones

Write the numeral.

9. twenty-six 26
10. one thousand, three hundred twenty-six 1326
11. three hundred twenty-six 326
12. five thousand, six hundred seventeen 5617
13. six thousand, four 6004
14. eight thousand, one hundred ninety-six 8196

What does the 2 mean in each number?

15. 2346 2 thousands
16. 8962 2 ones
17. 4289 2 hundreds
18. 1429 2 tens
19. 2684 2 thousands

**Using the Book** Refer to the display. Ask, “How many thousands?, How many hundreds?”, etc. Then write the number on the chalkboard. Write 92 on the chalkboard and ask the child how this number is read. (ninety-two) Then indicate the number is read as “four thousand, three hundred ninety-two”. Assign the balance of the page.

ACROSS

- a three thousand, one hundred twenty-nine
- e four thousand, three
- f one thousand, four hundred three
- g six hundred seventy
- i two thousand, four hundred seventy-five
- m eight hundred thirteen
- n five hundred twelve
- o four hundred twenty-one
- p six hundred
- q seven thousand, nine hundred thirty-four
- s nine thousand, two hundred fifty-four
- t four thousand, one hundred twelve
- w seven thousand, fourteen
- x six thousand, three hundred

DOWN

- a three thousand, four hundred ten
- b one hundred four
- c two hundred
- d nine thousand, three hundred thirty-two
- g six thousand, one hundred twenty-nine
- h seven thousand, three hundred thirteen
- j four thousand, five hundred sixty-two
- k seven thousand, one hundred five
- l five thousand, two hundred four
- m eight hundred forty-seven
- r four thousand, four hundred seventy-six
- s nine thousand, two hundred forty
- u one hundred three
- v one hundred ten

EXTRA PRACTICE

HMS—DM32.



# Counting

Jan made these charts.  
She placed straws in the pockets  
to show a number.

| thousands | hundreds | tens | ones |
|-----------|----------|------|------|
|           |          |      |      |

3 thousands 4 hundreds 1 ten 6 ones

3416

One more is

| thousands | hundreds | tens | ones |
|-----------|----------|------|------|
|           |          |      |      |

3417

And one more is

| thousands | hundreds | tens | ones |
|-----------|----------|------|------|
|           |          |      |      |

3418

We count: 3416 3417 3418 ...

Write the numeral. Then write the next two.

2523, 2524, 2525

| th | h | t | o |
|----|---|---|---|
|    |   |   |   |

| th | h | t | o |
|----|---|---|---|
|    |   |   |   |

5186, 5187, 5188

Copy and complete.

|     |      |      |      |      |      |      |      |
|-----|------|------|------|------|------|------|------|
| (a) | 1162 | 1163 | 1164 | 1165 | 1166 | 1167 | 1168 |
| (b) | 8743 | 8744 | 8745 | 8746 | 8747 | 8748 | 8749 |
| (c) | 3187 | 3188 | 3189 | 3190 | 3191 | 3192 | 3193 |

7234, 7235, 7236

| th | h | t | o |
|----|---|---|---|
|    |   |   |   |

| th | h | t | o |
|----|---|---|---|
|    |   |   |   |

2198, 2199, 2200

Counting in 4 digits 105

**Using the Book** Discuss the display. Use the technique outlined in the Initial Activities. Direct the child's attention to the place-value chart in the exercises. Ask, "What do you think o stands for? t? h? th? Why do you think th is used for thousands and not just t?" (Answer: t is used for tens so we want some different symbol for thousands.)

You may wish to do Exercises 1-4 in class with children writing the answers on the chalkboard.

Provide these harder ones also.

- (e) 1 more than 3019
- (f) 10 more than 2493
- (g) 100 more than 3521
- (h) 1000 more than 4999

3. Play this game orally with the class.

Have the children make 4 blanks on a sheet of paper \_ \_ \_ \_ which represent 4 place-value locations. Have one child randomly select 1 card from a deck of 10 cards which shows a numeral from 0 to 9.

Example 4

Each player may write that numeral in any one of the empty blanks. Cards are reshuffled and a second card selected. Winners are those who, when the fourth card has been selected, have placed digits in correct place-value locations to yield the greatest four-digit number.

This activity could be repeated with the object of the game being to yield the smallest four-digit number.

## EXTRA PRACTICE

HMS—DM32.

## OBJECTIVE

Given a four-digit number, to write the next number in the sequence

## PACING

Level A All  
Level B All  
Level C All

## MATERIALS

overhead projector, place-value chart on transparency, place-value chart, stir sticks

## RELATED AIDS

HMS—DM31 and DM32.

## SUGGESTIONS

**Initial Activity** Use the transparent place-value chart with stir sticks to represent a number (2354). Say, "Write the numeral." Then place one more stick in the one's pocket. Say, "Write this numeral." Then write 2356 on the chalkboard. Say, "Put another stick in the chart to show this number."

Repeat using 1963.

Then prepare for regrouping (page 107) by using 1729. Do not leave 10 sticks in a pocket but rather replace the 10 sticks in one pocket with 1 stick in the next pocket on the left.

Repeat using 1239, 1349, 1299, 2499.

## ACTIVITIES

1. The Egyptians printed numerals:  
for one — I  
for ten — 10  
for hundred — 100  
They could print 124 in several ways.

1111 2 100

or 11 2 100 11

or 100 11 2 11 100

- (a) What other ways could they write 124?
  - (b) How might they write 136? 205? 381?
  - (c) How does our number system differ from the Egyptians'?
- (Our number system has a place-value system so that 123 is different than 321.)

2. *Extension.* Provide the child with challenges of this type:  
Write the number.

- (a) 1 more than 4015
- (b) 10 more than 3246
- (c) 100 more than 4031
- (d) 1000 more than 6438

## OBJECTIVE

To compare the values of four-digit numbers

## PACING

Level A All  
Level B All  
Level C 3-11

## MATERIALS

overhead projector, place-value charts on transparency

## SUGGESTIONS

**Initial Activity** Using the overhead projector, put sample numbers in line for ease in comparison.

Compare as follows:  
thousands first,  
then hundreds,  
then tens,  
then ones.

Have the children do many examples with you before assigning the page.

As an alternate introduction, use two place-value charts with sticks in the pockets. Later you can use number cards in the pockets.

## ACTIVITIES

1. Collect pictures and prices of cars, homes, and so forth. The children compare values and write a statement.

*Example*

|        |        |
|--------|--------|
| VW     | FORD   |
| \$3429 | \$5468 |

|        |   |        |
|--------|---|--------|
| VW     | < | FORD   |
| \$3429 |   | \$5468 |

2. Direct the children to the "Numbers Game" in the Activity Reservoir. Modify to apply to four-digit numbers.

3. Enrichment.

Direct the children to choose 4 different digits. Ask them to write as many numbers as possible using each digit once only in each number.

Answer: (4, 5, 7, 8)

|      |      |      |      |
|------|------|------|------|
| 4578 | 5478 | 7458 | 8457 |
| 4587 | 5487 | 7485 | 8475 |
| 4857 | 5748 | 7548 | 8745 |
| 4875 | 5784 | 7584 | 8754 |
| 4758 | 5847 | 7854 | 8574 |
| 4785 | 5874 | 7845 | 8547 |

## Comparing

Which is more? 2417 or 3151?

Compare thousands first.

| th | h | t | o |
|----|---|---|---|
|    |   |   |   |

$2 < 3$

| th | h | t | o |
|----|---|---|---|
|    |   |   |   |

$2417 < 3151$

Compare thousands first.

| th | h | t | o |
|----|---|---|---|
|    |   |   |   |

$2 = 2$

Compare hundreds next.

$4 > 3$

| th | h | t | o |
|----|---|---|---|
|    |   |   |   |

$2415 > 2356$

Compare. Use  $>$  or  $<$ .

1. 3000

| th | h | t | o |
|----|---|---|---|
|    |   |   |   |

2. 3417

| th | h | t | o |
|----|---|---|---|
|    |   |   |   |

2000

| th | h | t | o |
|----|---|---|---|
|    |   |   |   |

3617

| th | h | t | o |
|----|---|---|---|
|    |   |   |   |

$3000 \bullet 2000 >$

$3417 \bullet 3617 <$

Copy and complete. Use  $>$  or  $<$ . Use your chart if necessary.

3. 3416  $\bullet$  3247      4. 8274  $\bullet$  8129  $>$       5. 1826  $\bullet$  1862  $<$

6. 1472  $\bullet$  1369  $>$       7. 5265  $\bullet$  2543  $>$       8. 8342  $\bullet$  8354  $<$

9. 2086  $\bullet$  2873  $<$       10. 4059  $\bullet$  5924  $<$       11. 9541  $\bullet$  9451  $>$

106 Comparing 4-digit numbers

**Using the Book** Use the display as a transition from the actual place-value chart to the printed page and printed symbol. Discuss the method illustrated. Review  $<$  and  $>$ .

You may wish to do Exercises 1-4 orally, with the children telling you *why* one number is greater than (less than) another. Assign Exercises 5-11. If difficulties arise have the children record each number in a place-value chart. Then remind them to start comparing with the digits on the left as in the display.



# Larger Sums

Add: 5 hundreds 6 tens 4 ones  
 Sum: 7 hundreds 1 ten 2 ones  
 or 1 thousands 2 hundreds 7 tens 6 ones

| th | h | t | o |
|----|---|---|---|
|    | 5 | 6 | 4 |
|    | 7 | 1 | 2 |
| 1  | 2 | 7 | 6 |

Add: 5 hundreds 4 tens 5 ones  
 Sum: 6 hundreds 7 tens 9 ones  
 or 1 thousands 2 hundreds 2 tens 4 ones

| th | h | t | o |
|----|---|---|---|
|    | 5 | 4 | 5 |
|    | 6 | 7 | 9 |
| 1  | 2 | 2 | 4 |

Copy and add.

| <table border="1"> <tr><th>th</th><th>h</th><th>t</th><th>o</th></tr> <tr><td></td><td>8</td><td>6</td><td>5</td></tr> <tr><td></td><td>5</td><td>2</td><td>4</td></tr> <tr><td></td><td></td><td></td><td></td></tr> </table> <p>1 3 8 9</p> | th                             | h                              | t                              | o                              |  | 8 | 6 | 5 |  | 5 | 2 | 4 |  |  |  |  | <table border="1"> <tr><th>th</th><th>h</th><th>t</th><th>o</th></tr> <tr><td></td><td>8</td><td>8</td><td>9</td></tr> <tr><td></td><td>4</td><td>1</td><td>0</td></tr> <tr><td></td><td></td><td></td><td></td></tr> </table> <p>1 2 9 9</p> | th | h | t | o |  | 8 | 8 | 9 |  | 4 | 1 | 0 |  |  |  |  | <table border="1"> <tr><th>th</th><th>h</th><th>t</th><th>o</th></tr> <tr><td></td><td>4</td><td>2</td><td>7</td></tr> <tr><td></td><td>7</td><td>8</td><td>8</td></tr> <tr><td></td><td></td><td></td><td></td></tr> </table> <p>1 2 1 5</p> | th | h | t | o |  | 4 | 2 | 7 |  | 7 | 8 | 8 |  |  |  |  | <table border="1"> <tr><th>th</th><th>h</th><th>t</th><th>o</th></tr> <tr><td></td><td>5</td><td>4</td><td>8</td></tr> <tr><td></td><td>6</td><td>7</td><td>7</td></tr> <tr><td></td><td></td><td></td><td></td></tr> </table> <p>1 2 2 5</p> | th | h | t | o |  | 5 | 4 | 8 |  | 6 | 7 | 7 |  |  |  |  |
|---|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--|---|---|---|--|---|---|---|--|--|--|--|---|----|---|---|---|--|---|---|---|--|---|---|---|--|--|--|--|---|----|---|---|---|--|---|---|---|--|---|---|---|--|--|--|--|---|----|---|---|---|--|---|---|---|--|---|---|---|--|--|--|--|
| th  | h                              | t                              | o                              |                                |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |
|   | 8                              | 6                              | 5                              |                                |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |
|   | 5                              | 2                              | 4                              |                                |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |
|   |                                |                                |                                |                                |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |
| th  | h                              | t                              | o                              |                                |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |
|   | 8                              | 8                              | 9                              |                                |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |
|   | 4                              | 1                              | 0                              |                                |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |
|   |                                |                                |                                |                                |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |
| th  | h                              | t                              | o                              |                                |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |
|   | 4                              | 2                              | 7                              |                                |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |
|   | 7                              | 8                              | 8                              |                                |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |
|   |                                |                                |                                |                                |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |
| th  | h                              | t                              | o                              |                                |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |
|   | 5                              | 4                              | 8                              |                                |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |
|   | 6                              | 7                              | 7                              |                                |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |
|   |                                |                                |                                |                                |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |
| 6. 325<br>+864<br><u>1189</u>   | 7. 643<br>+544<br><u>1187</u>  | 8. 609<br>+690<br><u>1299</u>  | 9. 769<br>+401<br><u>1170</u>  | 10. 635<br>+825<br><u>1460</u> |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |
| 11. 649<br>+562<br><u>1211</u>  | 12. 711<br>+699<br><u>1410</u> | 13. 573<br>+848<br><u>1421</u> | 14. 439<br>+984<br><u>1423</u> | 15. 777<br>+666<br><u>1443</u> |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |   |    |   |   |   |  |   |   |   |  |   |   |   |  |  |  |  |

Addition to 4-digit sums 107

**Using the Book** In discussing the display, point out how 12 hundreds is written as 1 thousand and 2 hundreds. Provide the children with 0.5 cm graph paper to do these exercises. This will help them keep the digits in the correct columns.

desk. The next child repeats this procedure. The first team to get 5 (10) done correctly is the winner.

**Variation:** Vary the method of getting to the chalkboard, for instance, one hand must be on the ankle at all times; must walk backwards at all times; etc.

## EXTRA PRACTICE

HMS—DM33.

|              |              |              |              |
|--------------|--------------|--------------|--------------|
| 381<br>+ 911 | 703<br>+ 540 | 638<br>+ 729 | 547<br>+ 588 |
|--------------|--------------|--------------|--------------|

2. Provide a set of cards with exercises of this type on each. The children are to provide the missing data.

|               |               |                |
|---------------|---------------|----------------|
| 3 ■■<br>+ 245 | 2 ■■<br>+ 847 | ■ 3 ■<br>+ 396 |
| 597           | 1100          | 11 ■4          |

3. A relay game may be played. Each player of each team takes a turn selecting a card, going to the chalkboard on a definite route, doing the question, and returning to the

## OBJECTIVE

To find the sum of three-digit numbers with regrouping in the ten's and hundred's columns

## PACING

Level A All  
 Level B All  
 Level C 1-3, 6-15

## MATERIALS

overhead projector, coloured transparent window sheet with window cut out to show 4 numbers vertically, sticks, elastics

## RELATED AIDS

BFA COMP LAB I—31, 39.  
 HMS—DM33.

## SUGGESTIONS

**Initial Activity** Review briefly addition of three addends and the meaning of place value in reference to the relative position of numbers.

Using the overhead projector and the window sheet, demonstrate the example at the top of page 107.

Emphasize the need to keep the numbers in line and the concept of putting any "extra tens" in the ten's column and any "extra hundreds" in the hundred's column.

Do many examples before assigning the page.

Discuss and emphasize the fact that the largest number that can be in the one's column is 9. Discuss what can be done if you have more than 9. Use bundles of sticks to illustrate. Emphasize that just as the bundle of sticks can be undone and *regrouped*, the same is true with numbers.

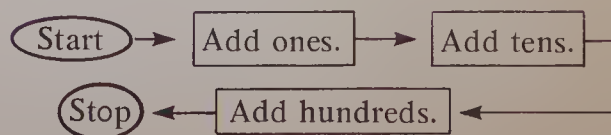
Record situations numerically and show how the second step in the question now involves the addition of 3 addends.

Use the window sheet to isolate the numbers in the ten's column.

|     |   |   |
|-----|---|---|
|     | 1 |   |
| 6   | 4 | 7 |
| + 4 | 2 | 4 |
|     | 7 |   |

## ACTIVITIES

1. Provide this flow chart to solve these.





OBJECTIVE

To provide practice in adding three-digit numbers

PACING

- Level A 1-15, 21-23
- Level B All
- Level C 6-23

RELATED AIDS

BFA COMP LAB I—39.

ACTIVITIES

1. Have a set of cards with three-digit numbers on them. The children draw two cards, write down the numerals for adding, and finally add the numbers. Some will involve regrouping and some will not.

Example

251

764

870

708

452

530

690

114

159

203

145

306

424

368

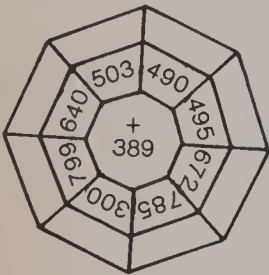
1

424

+ 368

792

2. Provide the children with duplicated problems of this type.



- 3. Direct the children to "Shuffle Numbers" in the Activity Reservoir. Modify to include three-digit numbers.
- 4. Direct the children to "Missing Numbers" in the Activity Reservoir. Use with three-digit addends and four-digit sums.

Practice

Copy and add.

- |                               |                               |                               |                               |                               |
|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| 1. 823<br>+415<br><u>1238</u> | 2. 326<br>+971<br><u>1297</u> | 3. 813<br>+981<br><u>1794</u> | 4. 761<br>+827<br><u>1588</u> | 5. 934<br>+965<br><u>1899</u> |
|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|

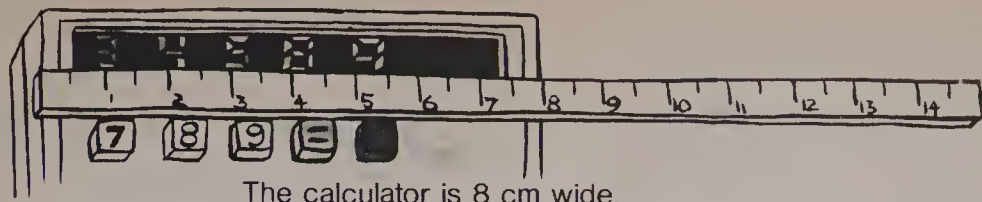
Look for patterns.

- |                                |                                |                                |                                |                                |
|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| 6. 618<br>+826<br><u>1444</u>  | 7. 637<br>+918<br><u>1555</u>  | 8. 908<br>+758<br><u>1666</u>  | 9. 909<br>+868<br><u>1777</u>  | 10. 909<br>+979<br><u>1888</u> |
| 11. 888<br>+346<br><u>1234</u> | 12. 677<br>+668<br><u>1345</u> | 13. 677<br>+779<br><u>1456</u> | 14. 778<br>+789<br><u>1567</u> | 15. 789<br>+889<br><u>1678</u> |
| 16. 235<br>+876<br><u>1111</u> | 17. 235<br>+987<br><u>1222</u> | 18. 679<br>+654<br><u>1333</u> | 19. 901<br>+543<br><u>1444</u> | 20. 679<br>+876<br><u>1555</u> |

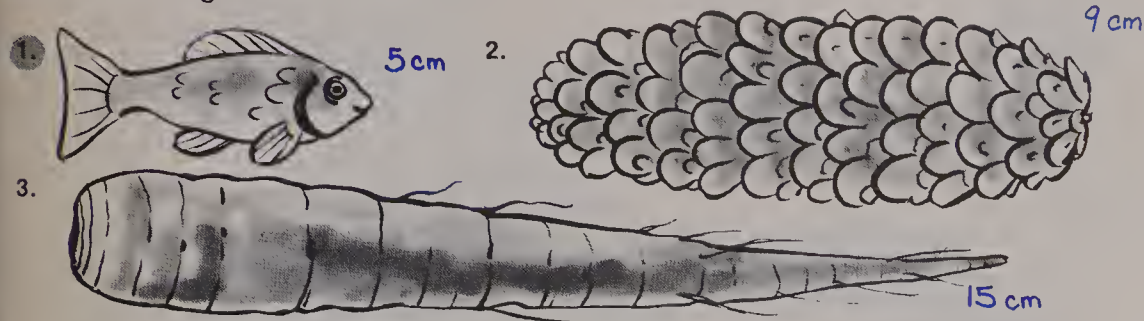
- 21. 574 people arrived before lunch. 739 people arrived after lunch. How many arrived during the day? **1313**
- 22. Lucille's Hot Dog Stand sold 642 hot dogs the first day and 859 the second day. How many hot dogs were sold altogether? **1501**
- 23. Handy Dandy sold 712 candy floss the first day and 979 the second day. How many candy floss were sold altogether? **1691**

**Using the Book** The children should work independently on these questions. If any children have unusual difficulty with this page, you may want to set up remedial work based on the type of questions found on this page. Some children may require a review of and more practice with the graphical type of Exercise 2, page 107. Others will profit from using 0.5 cm graph paper to do their work.

# Using Centimetres



Record the lengths in centimetres.



Solve the problems.

4. The whooping crane is about 124 cm tall.  
The sandhill crane is about 98 cm tall.  
How much taller is the whooping crane? **26 cm**
5. A robin is about 25 cm long.  
A wren is about 9 cm long.  
How much longer is the robin? **16 cm**
6. The whooping crane is about 137 cm long.  
The sandhill is about 115 cm long.  
How long are the two together? **252 cm**

Make this pattern using  
16 sticks of the same length.  
Move only 2 sticks to make  
4 squares.  
No sticks left over!



Centimetre 109

**Using the Book** Emphasize that children should decide what operation is required to get the correct answer. Ask them to pick out key words:

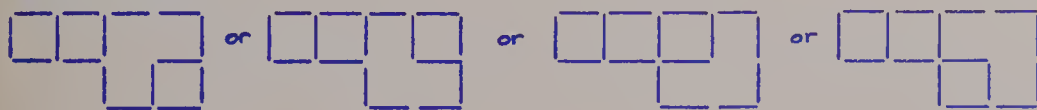
- Exercise 1: "How much taller..." (subtract)  
Exercise 2: "How much longer..." (subtract)  
Exercise 3: "How long... together?" (add)

Remind the child of the steps used in problem solving.

1. What is it about?
2. What is given?
3. Add or subtract?
4. Write sentence to answer questions.

In addition to the exercises on this page, provide the children with additional items to be measured; for example, crayon box, chalk, chalk brush, and so forth.

**Answers:**  
**Braintickler**



3. Ask the children to look up in an encyclopedia information about historical units of measurement: cubit, digit, fathom, nail, span, inch, foot, yard.

30 cm. Have child choose 5 sticks, estimate the length, and then measure.

| Stick | Estimate | My Measure |
|-------|----------|------------|
| 1     |          |            |
| 2     |          |            |
| 3     |          |            |

## EXTRA PRACTICE

HMS—DM34.

## OBJECTIVE

To measure in centimetres

## PACING

Level A All  
Level B All  
Level C All

## VOCABULARY

calculator, whooping, sandhill, wren

## MATERIALS

rulers marked in centimetres

## RELATED AIDS

HMS—DM34.

## SUGGESTIONS

**Initial Activity** Let the children use their handspans (or some other nonstandard unit) to measure various items in the classroom. Record. Then discuss why the handspan is not a suitable unit to use. (Sizes of handspans will vary therefore the measures of items will vary depending on who measured it.) Ask if they were buying cloth would they rather use their handspan or your (the teacher's) handspan to measure the cloth. Develop the idea that a standard unit is preferred since everybody uses the same unit.

Ask the children to use the width of their first finger to indicate 1 cm. They can then check this against a ruler. Then they can spread their thumb and second finger to indicate 10 cm. With these two referents the children will be able to give suitable estimates of lengths of certain objects.

## ACTIVITIES

1. Provide each child with a *Metric Me* chart. Children working in pairs can fill out their own charts.

### METRIC ME

|                |    |
|----------------|----|
| head           | cm |
| neck           | cm |
| waist          | cm |
| height         | cm |
| length of foot | cm |
| wrist          | cm |
| ankle          | cm |
| hips           | cm |
| arm span       | cm |

2. Provide fine dowling (about the cross section of a sucker stick) cut in various lengths from about 5 cm to



## OBJECTIVE

To measure an item to the nearest whole centimetre

## PACING

Level A All

Level B All

Level C All

## MATERIALS

a ruler marked in centimetres for each child

## ACTIVITIES

1. Provide additional items for children to measure. Measuring actual items that are not exact centimetre units requires lots of practice.

2. Arrange a scavenger hunt. Children are to find items of these lengths:

5 cm      20 cm

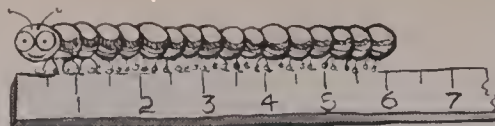
7 cm      35 cm

10 cm      50 cm

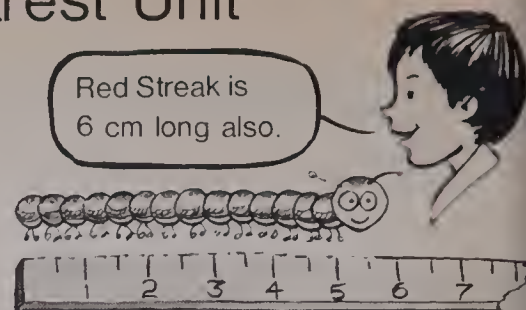
15 cm      100 cm

3. Ask the children to find the meaning of centi- as in "centimetre".

## To the Nearest Unit



Black Streak is 6 cm long.



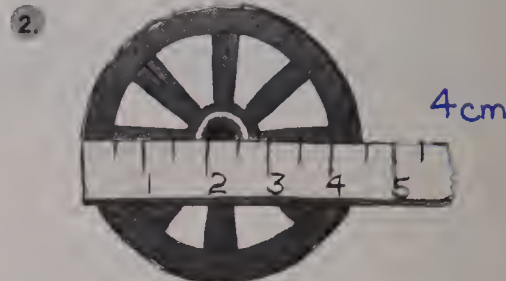
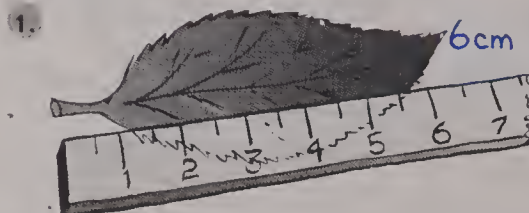
Red Streak is 6 cm long also.

Black Streak is closer to 6 cm than 7 cm.

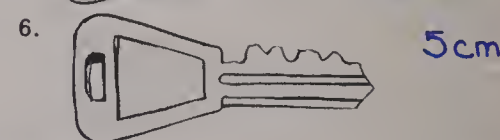
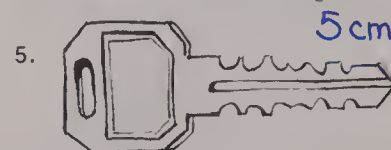
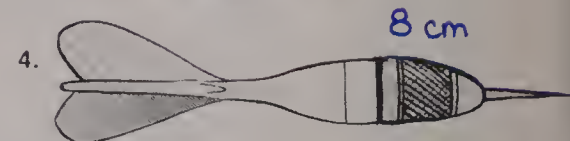
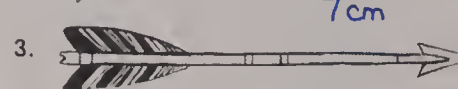
Red Streak is closer to 6 cm than 5 cm.

The lengths have been given to the nearest centimetre.

Write the measurements to the nearest centimetre.



Use your centimetre ruler.



110 Rounding

**Using the Book** Discuss with the class:

Why Black Streak is 6 cm long and not 7 cm long. (Closer to 6 cm than to 7 cm.)

Why Red Streak is 6 cm and not 5 cm long. (Closer to 6 cm than 5 cm.)

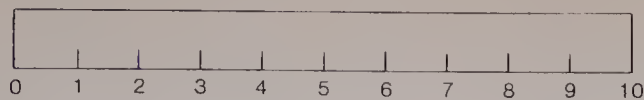
When would the measure be closer to 7 than to 6? (When it is over the 6.5 or halfway mark between 6 and 7.)

Ask the class to give the length of the leaf to the nearest centimetre. Discuss the answers.

Assign the balance of the page.



# The Decimetre (dm)



1 dm = 10 cm

A decimetre is equal to ten centimetres.

- What is the length of the feather in decimetres? **2 dm**
- What is the length in centimetres? **20 cm**

Write these measurements to the nearest decimetre.

3. length of your foot
4. length of a new pencil
5. width of this book
6. width of desk top
7. length from finger tip to elbow

8. Draw a segment 3 m long.
9. Use chalk to draw a segment 10 dm long on the floor. Get a friend to check your work.

10. Copy and complete.

- 1 dm = ■ cm **10**
- 2 dm = ■ cm **20**
- 3 dm = ■ cm **30**
- 4 dm = ■ cm **40**
- 5 dm = ■ cm **50**
- 6 dm = ■ cm **60**
- 7 dm = ■ cm **70**
- 8 dm = ■ cm **80**
- 9 dm = ■ cm **90**
- 10 dm = ■ cm **100**

## OBJECTIVES

- To measure an item to the nearest whole decimetre
- To convert decimetre measures to centimetres

## PACING

- Level A All
- Level B All
- Level C All

## VOCABULARY

decimetre

## MATERIALS

rulers marked in decimetres or in sets of 10 cm

## SUGGESTIONS

**Initial Activity** Direct the children to cut strips of paper 1 cm wide and 10 cm long. On each they should print "1 dm—10 cm". They can use these to measure the items suggested.

## ACTIVITIES

1. Have the children make a booklet. They choose one of these titles.  
My Centimetre Book  
My Metre Book  
My Decimetre Book  
On each page in the booklet have them draw a picture of something they think is a centimetre long (or metre long). Below the picture tell how long it was found to be. How much was their error?

2. Arrange a scavenger hunt. Children are to find items with these measurements:

- 1 dm      10 dm
- 3 dm      15 dm
- 5 dm      20 dm

3. Direct children to copy and complete.

- 10 cm = \_\_\_ dm
- 20 cm = \_\_\_ dm
- 50 cm = \_\_\_ dm
- 70 cm = \_\_\_ dm
- 100 cm = \_\_\_ dm
- 150 cm = \_\_\_ dm

4. Ask the children to find the meaning of deci- as in "decimetre".

## Using the Book Review:

- 1 dm = 10 cm,
- 2 dm = ■ cm,
- and so forth.

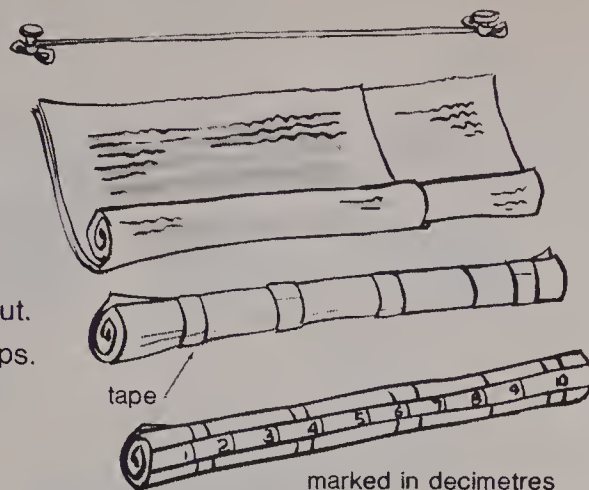
Direct the children to measure (Exercises 3-7) to the nearest decimetre. Use chalk to do Exercises 8 and 9 on the floor. Provide metresticks.



# Make a Metrestick

10 dm = 1 m  
ten decimetres = one metre

1. Use the metre-string.
  - (a) On the floor place two full sheets of newspaper so the metre-string fits.
  - (b) Roll the newspaper to make a **metrestick**.
  - (c) Tape.



2.
  - (a) Make a decimetre strip. Cut out.
  - (b) Cut out 9 more decimetre strips.
  - (c) Place them end to end.
  - (d) Glue to the metrestick.
  - (e) Label.

3. Copy and complete.

- |  |  |  |
|--|--|--|
| (a) 1 m = <input type="checkbox"/> dm 10 | (b) 2 m = <input type="checkbox"/> dm 20 | (c) 3 m = <input type="checkbox"/> dm 30 |
| (d) 4 m = <input type="checkbox"/> dm 40 | (e) 5 m = <input type="checkbox"/> dm 50 | (f) 6 m = <input type="checkbox"/> dm 60 |
| (g) 7 m = <input type="checkbox"/> dm 70 | (h) 8 m = <input type="checkbox"/> dm 80 | (i) 9 m = <input type="checkbox"/> dm 90 |

4. What is the measure of each in centimetres or metres?  
Which unit will you use — centimetre or metre?

- |  |   |
|--|---|
| (a) width of this book <b>centimetre</b> | (b) height of your desk <b>centimetre</b> |
| (c) width of the classroom <b>metre</b>  | (d) length of your foot <b>centimetre</b> |
| (e) height of a door <b>metre</b>        | (f) length of the school <b>metre</b>     |

Metre and decimetre 113

**Using the Book** Take time to allow children to make and mark their paper metresticks. The metresticks become very colourful if each decimetre is a different colour.

Identify objects that children are to measure using their metrestick. Direct them to record their measures two ways:

- (a) in metres and decimetres; for instance, 2 m 4 dm.
  - (b) in metres rounded to the nearest whole metre; for instance, 2 m.
- Later the children will use decimal notation.

Before children start the activities, emphasize that, as stated in the display, 10 dm = 1 m.

## OBJECTIVES

To develop the relation: 10 dm = 1 m  
To convert measures in metres to measures in decimetres

## PACING

Level A All  
Level B All  
Level C All

## MATERIALS

newspapers — 2 or 4 full pages per child, tape, felt pen for marking, metre-string from previous page

## ACTIVITIES

1. Direct the children to use their metresticks to measure each in metres and decimetres.

- (a) length of teacher's desk
- (b) length of chalkboard
- (c) width of door
- (d) arm span
- (e) height

2. Ask children to find items of these lengths.

- |              |              |
|--------------|--------------|
| (a) 1 m 5 dm | (b) 1 m 8 dm |
| (c) 2 m 4 dm | (d) 3 m      |
| (e) 3 m 8 dm |              |

3. Direct the children to the "Metric Bingo" game in the Activity Reservoir.

4. *Extension.* Direct children to copy and complete.

- (a) 10 dm =  m
- (b) 11 dm =  m  dm
- (c) 12 dm =  m  dm
- (d) 15 dm =  m  dm
- (e) 18 dm =  m  dm
- (f) 20 dm =  m  dm
- (g) 25 dm =  m  dm
- (h) 28 dm =  m  dm
- (i) 30 dm =  m  dm
- (j) 35 dm =  m  dm



OBJECTIVE

To estimate lengths in metres and centimetres

PACING

- Level A All
- Level B All
- Level C All

MATERIALS

centimetre rulers, metre sticks (page 113)

RELATED AIDS

HMS—DM35.

SUGGESTIONS

**Initial Activity** Reinforce the principle that short or small items (less than a metre) are best measured in centimetres. To do this, discuss with the class or group which ruler — the centimetre or metre ruler — they would use to measure each item. They will then realize why the instructions say to use the centimetre ruler to check the first three questions and the metre stick to check the balance. Note: The length of a desk is a metre or more hence a metre stick can be used.

ACTIVITIES

1. Children enjoy guessing (estimating) when they have referents fixed in their minds. Additional practice may be necessary.

Have the children prepare a chart.

Make a list of things in your classroom:

|             | Item |
|-------------|------|
| about 1 cm  |      |
| about 10 cm |      |
| about 50 cm |      |
| about 1 m   |      |
| about 2 m   |      |
| about 5 m   |      |

2. Have the children establish a “measuring corner” in the classroom, and let them estimate then measure the various items.

3. Challenge children to draw segments, with chalk, the lengths shown. After each length is drawn, it should be checked. In this way, children will improve as they practise.

- (a) 10 cm
- (b) 5 dm
- (c) 60 cm
- (d) 100 cm
- (e) 15 dm
- (f) 2 m
- (g) 3 m
- (h) 5 cm

I guess the worm is 12 cm long.

Guessing Length

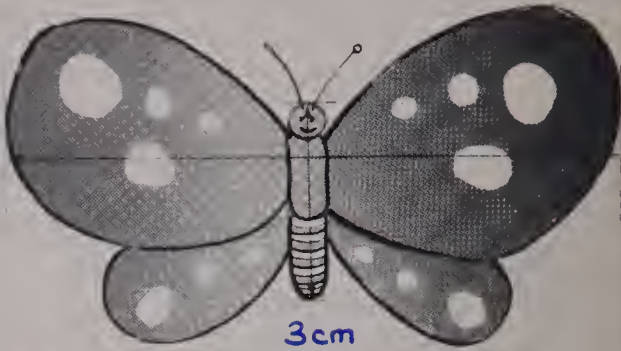
Your guess is very close.



Guess the length. Record.  
Use a centimetre ruler to check.

- 1. length of wings
- length of body

10 cm



3 cm

2.

9 cm



3.



2 cm

Guess these. Record.  
Use a metre stick to check.

- 4. height of your desk
- 5. length of teacher's desk
- 6. your height
- 7. height of door
- 8. height of wall
- 9. width of chalkboard

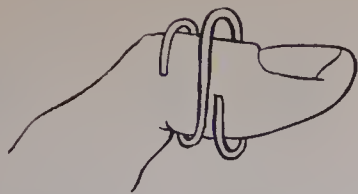
114 Estimation

**Using the Book** Provide the children with a recording form (DM35).

| What | I think | It is |
|------|---------|-------|
|      |         |       |
|      |         |       |
|      |         |       |

The child records the name of the item, estimates its measure, then measures it. The estimates should improve as the number of items increases.

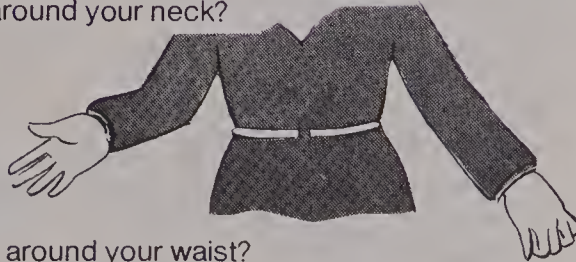
## Is It True?



Twice around your thumb *is about* once around your wrist?



Twice around your wrist *is about* once around your neck?



Twice around your neck *is about* once around your waist?



Twice around your waist *is about* your height?

Estimation 115

**Using the Book** Group the class into twos. Provide each pair with the string. Remind them that the question asks: "Is one *about* the same as the other?"

Unless a child is particularly tall (or short) for his size (thin or heavy), the answers will be "yes" for each.

## OBJECTIVE

To round and estimate

## PACING

Level A All  
Level B All  
Level C All

## MATERIALS

about 2 m of string for each group of two children (if they work in groups)

## ACTIVITIES

1. Provide the child with a  $4 \times 4$  square.



Ask, "How many different squares and rectangles are there?"

Answer: 100

$$1 \times 1 = 16$$

$$1 \times 2 = 24$$

$$1 \times 3 = 16$$

$$1 \times 4 = 8$$

$$2 \times 2 = 9$$

$$2 \times 3 = 12$$

$$2 \times 4 = 6$$

$$3 \times 3 = 4$$

$$3 \times 4 = 4$$

$$4 \times 4 = 1$$

2. Draw several line segments in various locations on the chalkboards using white chalk. Then use coloured chalk to go over a section of each line segment — each should be a fraction of the total line; for instance,  $\frac{1}{3}$ ,  $\frac{1}{5}$ , and so on.

Give these instructions:

- (1) Measure the length of the coloured section of the first line segment.
- (2) Estimate how long the total line segment is.
- (3) Measure to check your estimate.
- (4) Repeat steps 1, 2, and 3 for each line segment.

## OBJECTIVES

- To introduce the kilometre
- To develop the relation:  $1000\text{ m} = 1\text{ km}$
- To interpret a simple map

## PACING

- Level A 1-4, 6
- Level B All
- Level C All

## VOCABULARY

kilometre (km)

## BACKGROUND

$1\text{ km} = 1000\text{ m}$

## SUGGESTIONS

**Initial Activity** Discuss road signs that tell how far it is to certain cities or places. Such distances are measured in kilometres.

## ACTIVITIES

- After determining a kilometre, some children may wish to see how long it takes them to ride a bicycle 1 km. Time them.
- Prepare two sets of flash cards.

|      |
|------|
| 2 km |
| ? m  |

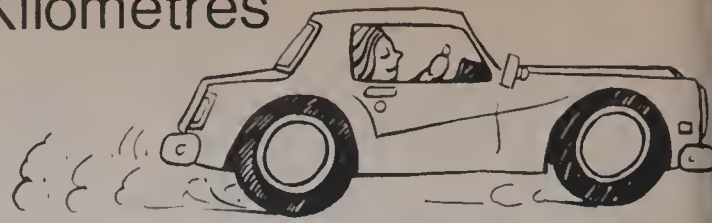
|        |
|--------|
| 3000 m |
| ? km   |

Set up teams. As each card is flashed to the teams in turn, members take turns giving the answers. The team with the most correct answers is the winner.

- Challenge: Is the distance around the school grounds more or less than 1 km? Check.
- Direct the children to "Metric Bingo" in the Activity Reservoir. Modify to apply to this section.



## Kilometres



Distances travelled by car or bicycle are measured in **kilometres**.

$$1000\text{ m} = 1\text{ km}$$

$$\text{one thousand metres} = \text{one kilometre}$$

- Tom's father drove him to Mary's house, then to Ken's house.  
How far did Tom's father drive? **5 km**

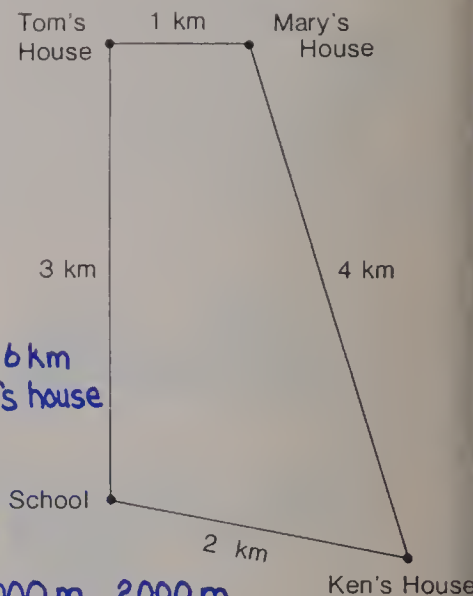
- Tom's mother drove to Mary's house, then to Ken's house, and then to school.  
How far did she drive? **7 km**

- Mary wants to go to school.  
(a) How far is it if she goes past Tom's house? past Ken's house? **4 km; 6 km**  
(b) Which route is shorter? by how many kilometres? **by Tom's house 2 km**

- Ken wants to go to Tom's house.  
What is the shorter route? **both the same**

- How many metres in a kilometre? in 2 km? **1000 m, 2000 m**

- How far is a kilometre?  
To find out, walk around your school counting your steps to 200. Do this 10 times. This distance is about 1 km.



**Using the Book** The first five questions will get the children used to the word kilometre and symbol km.

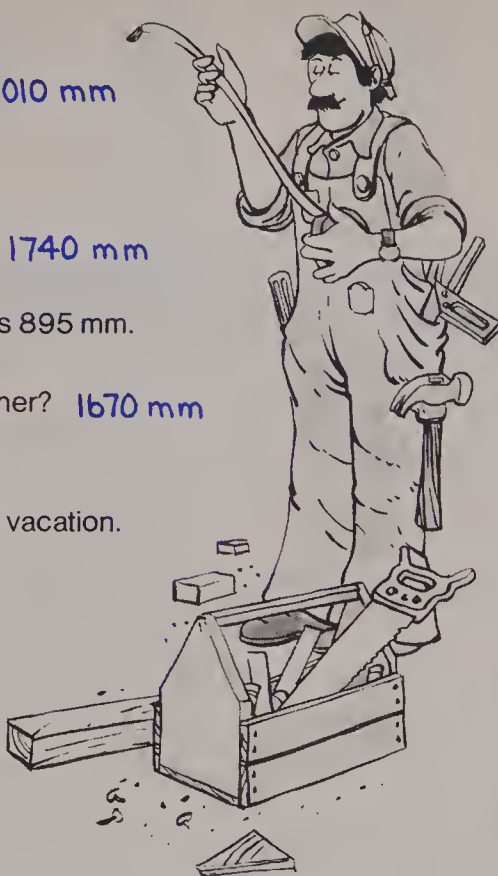
To build a referent for a kilometre, let them experience how long it takes to walk a kilometre. Exercise 6 describes one way. (Two student-steps approximate a metre.)



# The Carpenter

The carpenter uses centimetres and metres when measuring.

1. Hans measured two boards.  
First board was 334 mm.  
Second board was 676 mm.  
How long were the two boards together? **1010 mm**
2. The first fence was 760 mm.  
The second fence was 980 mm.  
How long were the two fences together? **1740 mm**
3. The eaves trough on one side of the house is 895 mm.  
On the other side it is 775 mm.  
How much eaves trough was there altogether? **1670 mm**
4. The distance to the work site is 790 km.  
Hans travelled home and back on a weeks vacation.  
How far did he travel? **1580 km**
5. Hans needed 1680 mm of trim.  
He had 1560 mm.  
Did he have enough? **No, he was 120 mm short.**
6. A carpenter needed 1200 m of siding.  
One load that was delivered had 850 m.  
The other load had 360 m.  
Did he have enough? **yes**



Solving measurement problems 117

**Using the Book** Review the steps in problem solving (as in Using the Book, page 109). Some groups may profit from having individuals read aloud the questions before they are assigned. A discussion of the work of a carpenter (see Chapter Overview) may add interest and relevance to this page.

## OBJECTIVE

- To solve word problems involving:
- (a) adding three-digit numbers involving millimetre and metre measures
  - (b) comparing three-digit numbers

## PACING

- Level A 1-5  
Level B 1-5  
Level C All

## VOCABULARY

carpenter

## MATERIALS

2 strips of paper: one 250 mm, one 480 mm

## BACKGROUND

See Chapter Overview.

## SUGGESTIONS

**Initial Activity** Show the children the two strips of paper end to end. Ask how many millimetres long the two strips are. Guide the children to write an addition sentence. Elicit the fact that we add to get the total length of two strips. (How long ... *altogether*?) Then place the strips one above the other with the two left ends matched. Ask how much longer one is from the other. Guide the children to write a subtraction sentence. Elicit the fact that we subtract to find the difference in the lengths of two strips. (Did he have enough?)

## ACTIVITIES

1. Have the children draw pictures to illustrate the types of work carpenters do.
2. Challenge: What happens if you do the following steps?
  - Step 1. Choose 3 different digits.
  - Step 2. Arrange them to make the largest number.
  - Step 3. Arrange them to make the smallest number.
  - Step 4. Subtract the smallest number from the largest number.
  - Step 5. Take the answer and repeat steps 1 to 4 again.  
And repeat again, and again, and ...  
What happens? (Answer: Eventually one gets the digits 4, 9, 5 and they keep repeating.)

## OBJECTIVE

To review the kilogram

## PACING

Level A 1-14, 17, 18, 21, 22

Level B 1-4, 9-14, 17, 18, 21-24

Level C 1-24

## VOCABULARY

kilogram (kg), combined, combinations

## MATERIALS

balance scales: masses marked in kilograms (plastic zip-bags with different quantities of gravel make good mass units; 1 kg, 2 kg, 3 kg, and 4 kg are good sizes); some objects with different masses: phone book, different-size rocks, shoe, ball, and so forth

## SUGGESTIONS

**Initial Activity** Ask the child to name some units we use to measure the amount of mass in an object. (gram or kilogram)

Ask which is greater — 1 g or 1 kg. (1 kg)

Ask how much mass is in their textbook.

Tell them that since grams are such a small unit of mass, we will measure the mass of objects in kilograms first.

Provide the child with several objects that have a mass of 1 kg so that they have referents for 1 kg.

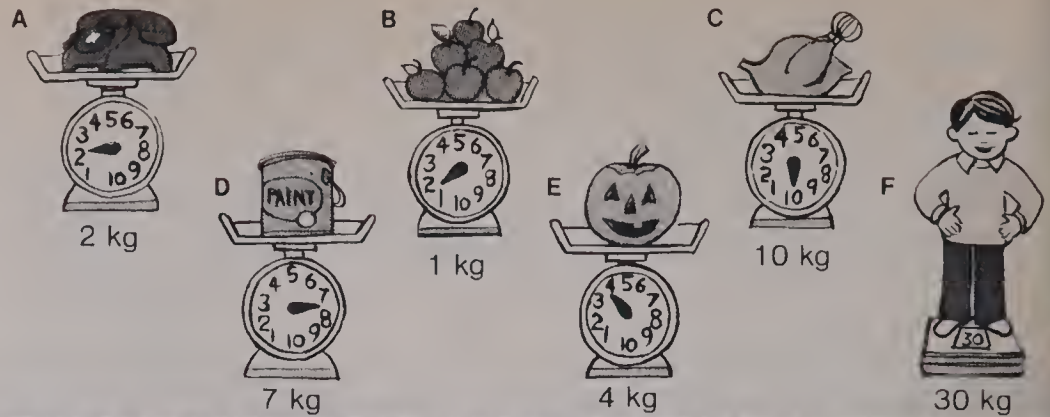
## ACTIVITIES

1. Provide the class with different objects suitable for placing on a balance. The children can counterbalance the object using the kilogram masses — commercial sets or the gravel-bag sets.

2. Provide a bathroom scale. Have the children work in pairs. Tell them to guess one another's mass, then check their guesses by using the scale. Then they can guess the mass of 5 encyclopedia books and then check. Choose 3 other suitable objects of 5 or more kilograms. The child with the most closest guesses is the winner.

3. Make this puzzle from cardboard. Cut on the dotted lines. Challenge the children to reassemble the pieces to form the letter T.

## The Kilogram



The kilogram (kg) is a unit used to measure the mass of an object.

What is the combined mass of the following?

1. apples and pail of paint **8 kg**
2. turkey and apples **11 kg**
3. phone, paint, and turkey **19 kg**
4. large pumpkin and boy **34 kg**

List the items that have the following combined masses.

5. 3 kg **A, B**
6. 6 kg **A, E**
7. 9 kg **A, D**
8. 15 kg **B, C, E**
9. 16 kg **A, C, E**
10. 18 kg **B, C, D**
11. 19 kg **A, C, D**
12. 20 kg **A, B, C, D**
13. 21 kg **C, D, E**
14. 40 kg **C, F**
15. 32 kg **A, F**
16. 35 kg **B, E, F**

How many different combinations of items have the following combined masses?

17. 12 kg **A, C, B, D, E**
18. 13 kg **A, B, C, A, D, E**
19. 14 kg **C, E, A, B, D, E**
20. 41 kg **B, C, F, D, E, F**

Can you combine items to make the following masses?

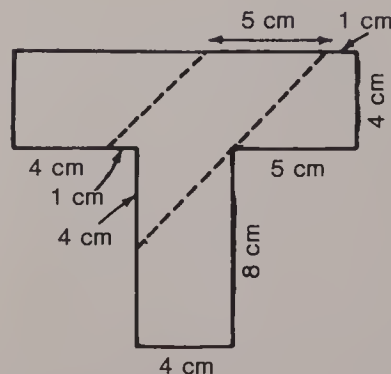
21. 25 kg **No**
22. 50 kg **Yes, A, B, C, D, F**
23. 55 kg **No**
24. 28 kg **No**

118 Mass the kilogram

**Using the Book** Review the kilogram (kg).

Present some objects and their masses in kilograms.

Do Exercises 1 and 5 in class. Then assign as indicated.

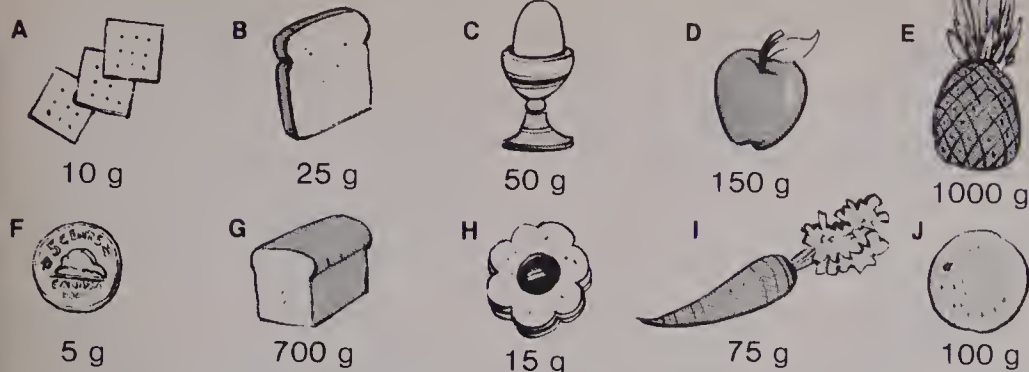




# Using Grams

1 kg = 1000 g

one kilogram = one thousand grams



What is the combined mass of the following?

1. a cookie and an apple **165g**
2. a slice of bread and an egg **75g**
3. 3 soda crackers, an egg, and an orange **160g**
4. Which object has a mass of 1 kg? **E (pineapple)**
5. Which 4 objects have a mass of 1 kg altogether? **C, D, G, J**
6. Which 5 objects have a mass of 1 kg altogether? **B, C, D, G, I**

Which objects have the following combined masses?

7. 140 g
8. 40 g
9. 60 g
10. 300 g
11. 400 g

What would you put on the scale pan to balance the following?

12. **C, J or B, C, I or A, B, H, J**
13. **B, C or A, C, H**
14. **C, D, G, J or B, C, D, G, I or A, B, D, G, H, J or A, C, D, G, H, I**

The gram 119

**Using the Book** For Exercises 12-14, the children should name objects that have a combined mass equal to that object shown.

## Answers:

7. B, H, J or C, H, I or A, B, F, J or A, C, F, I
8. B, H or A, B, F
9. A, C
10. C, D, J or B, C, D, I or A, B, D, H, J or A, C, D, H, I
11. B, C, D, I, J or A, C, D, H, I, J

## OBJECTIVE

To work with gram masses

## PACING

- Level A 1-11  
Level B 4-14  
Level C 4-14

## VOCABULARY

gram (g)

## MATERIALS

plastic zip-bags with gravel to make 10, 20, 30, 50, 100, 200, 500, and 700 g; balance scale and various objects for weighing

## SUGGESTIONS

**Initial Activity** Introduce the gram (g) by explaining that the kilogram is a pretty large unit and that a smaller unit is needed to weigh small objects. Use a scale and let different children take turns weighing various objects.

Discuss with the children that a kilogram is 1000 g. Ask how many grams in:

- (a) 2 kg
- (b) 3 kg
- (c) half of a kilogram.

## ACTIVITIES

1. Provide the children with this activity card.

| Make a list of things in your room: |      |
|-------------------------------------|------|
|                                     | Item |
| about 1 g                           |      |
| about 10 g                          |      |
| about 50 g                          |      |
| about 100 g                         |      |

2. Provide the children with this activity card.

Read the labels on food boxes to find the masses in grams. Bring the labels or boxes to school for the Display Table. Make a list of things measured in grams.

3. Provide the children with this exercise. Which is the better unit to measure the mass of each item, the gram or kilogram?

- (a) orange (g)
- (b) glue bottle (g)
- (c) typewriter (kg)
- (d) chocolate bar (g)
- (e) letter (g)
- (f) bowling ball (kg)
- (g) large pumpkin (kg)
- (h) golf ball (g)
- (i) turkey (kg)
- (j) television set (kg)



## OBJECTIVE

To round to the nearest kilogram and to the nearest 10 kg

## PACING

Level A All  
Level B All  
Level C All

## RELATED AIDS

HMS—DM36.

## ACTIVITIES

1. Arrange a scavenger hunt. Children are to find items of these masses rounded):

1 g  
5 g  
50 g  
1 kg  
2 kg  
5 kg

2. Prepare a set of incomplete magic squares for children to complete. Explain how a magic square works.

|   |   |   |
|---|---|---|
| 5 |   |   |
|   | 6 |   |
| 3 |   | 7 |

|    |    |   |
|----|----|---|
| 7  |    |   |
| 12 |    | 4 |
| 5  | 10 |   |

|   |  |   |   |
|---|--|---|---|
| ★ |  | 3 |   |
|   |  | 5 | 1 |
|   |  | 7 |   |

|   |   |  |
|---|---|--|
| 4 |   |  |
| 9 | 7 |  |
| 8 |   |  |

|   |  |    |
|---|--|----|
|   |  | 7  |
| 1 |  | 17 |
|   |  | 3  |

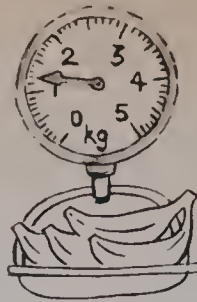
|   |    |    |  |
|---|----|----|--|
| ★ |    | 6  |  |
|   | 12 | 8  |  |
|   |    | 10 |  |

3. Ask the children to find the meaning of kilo- as in "kilogram".

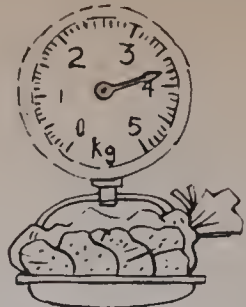
## EXTRA PRACTICE

HMS—DM36.

## Rounding

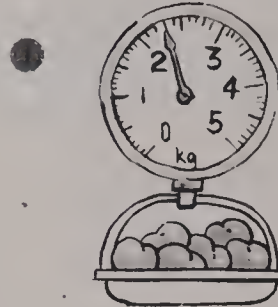


It is closer to 1 kg than to 2 kg.  
The mass rounded to the nearest kilogram is 1 kg.

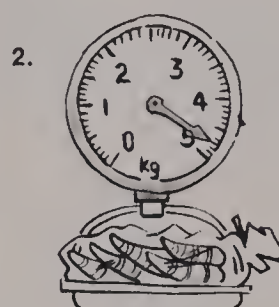


It is closer to 4 kg than to 3 kg.  
The mass rounded to the nearest kilogram is 4 kg.

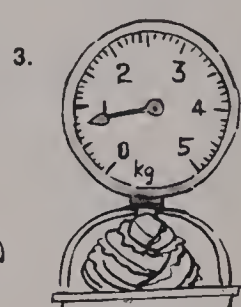
Read the scale. Which is closer?



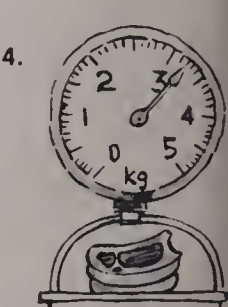
2 kg or 3 kg. **2 kg**



4 kg or 5 kg. **5 kg**



0 kg or 1 kg. **1 kg**

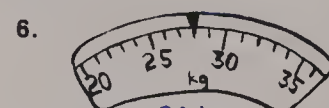


3 kg or 4 kg. **3 kg**

Write the mass rounded to the nearest 10 kg.



**20 kg**



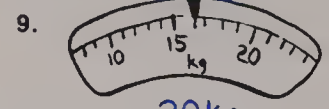
**30 kg**



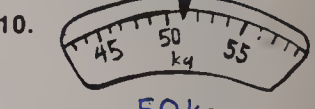
**30 kg**



**50 kg**



**20 kg**



**50 kg**

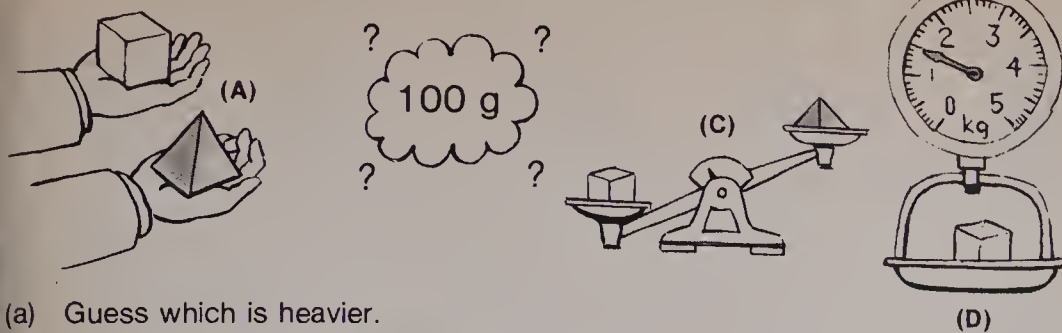
120 Rounding

**Using the Book** This page is similar to page 110. We do not deal with the "halfway" situation. If it arises use the rule: "When it is halfway we round up to the larger unit."

In Exercises 1-4, each is to be rounded to the nearest kilogram; in Exercises 5-10, to the nearest 10 kg (multiple of 10).

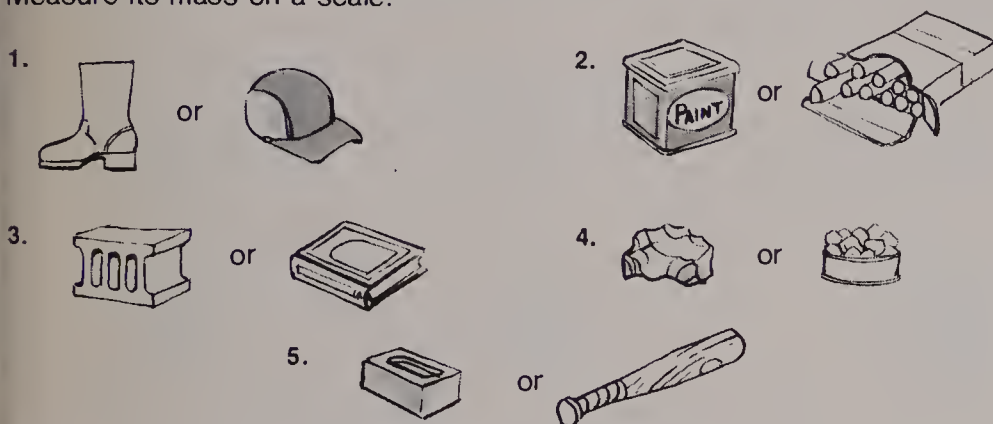
Emphasize that they should ask themselves: "Is it closer to 30 than to 40 or to 40 than to 30?" They should fill the blanks in with the appropriate ten units.

# Guessing and Checking



- Guess which is heavier.
- Guess the mass of the heavier one.
- Check.
- Place it on a scale to check its mass.

Which object in each of these pairs is heavier?  
Guess the mass of the heavier one in kilograms.  
Measure its mass on a scale.



Estimating, concept of heavier 121

**Using the Book** The children, taking each pair of objects in turn, are to guess, record, then check by placing the two objects on opposite sides of a balance.

Practice in finding mass can be provided by asking the children to find the mass of each object. This may involve rounding to the nearest kilogram. (If a mass is an even half unit, i.e., 3.5 kg, we use the rule "round up". However, this rule is not introduced formally at this time and would be dealt with only if it arises.)

## OBJECTIVES

- To guess which is the heavier of two objects
- To guess the mass of an object
- To use a scale to find the mass of an object

## PACING

- Level A All
- Level B All
- Level C All

## MATERIALS

scale marked in kilograms or balance scale with unit masses, the objects illustrated or a set of similar objects

## RELATED AIDS

HMS—DM35.

## BACKGROUND

This page deals with "heavier". Use the word "lighter" also, i.e., "A is heavier than B, therefore B is lighter than A."

## ACTIVITIES

- Provide the class with a set of items: some of 1 kg, some less, and some more. The children complete charts to show their estimates. They can check each estimate as they make them in order to improve their estimating ability.

| Item | Less than 1 kg | About 1 kg | More than 1 kg |
|------|----------------|------------|----------------|
|      |                |            |                |

- Challenge the children with these magic squares.

|    |    |    |    |
|----|----|----|----|
|    | 12 | 8  | 13 |
|    |    | 10 |    |
| 14 | 7  |    |    |
| 4  |    |    | 16 |

|    |    |   |    |
|----|----|---|----|
| 13 |    |   | 1  |
| 3  |    |   | 15 |
| 2  | 11 |   |    |
| 16 |    | 9 | 4  |

|    |   |    |    |    |
|----|---|----|----|----|
| ★  | 1 | 15 | 14 |    |
|    |   |    |    |    |
|    |   | 10 | 11 | 5  |
| 13 |   |    |    | 16 |

- Direct children to copy and complete.

- 1 kg = \_\_\_ g
- 2 kg = \_\_\_ g
- 5 kg = \_\_\_ g
- 7 kg = \_\_\_ g
- 10 kg = \_\_\_ g
- 1000 g = \_\_\_ kg
- 2000 g = \_\_\_ kg
- 3000 g = \_\_\_ kg
- 10 000 g = \_\_\_ kg

OBJECTIVE

To evaluate achievement of the chapter objectives

PACING

- Level A All
- Level B All
- Level C All

RELATED AIDS

HMS—DM1 and DM37.

Chapter Test

Add.

1. 314  
+ 852  

---

1166

2. 764  
+ 628  

---

1392

3. 894  
+ 683  

---

1577

4. 634  
+ 678  

---

1312

5. 745  
+ 698  

---

1443

6. Guess the length in centimetres.

- (a) \_\_\_\_\_ 5cm
- (b) \_\_\_\_\_ 8

7. Use a ruler and measure to the nearest centimetre.

- \_\_\_\_\_ 4cm
- \_\_\_\_\_ 2 cm
- \_\_\_\_\_ 4 cm
- \_\_\_\_\_ 7cm




8. Round each to the nearest 10 kg.

- (a)  30kg
- (b)  20kg
- (c)  50kg

9. Round to the nearest kilogram.

- (a)  2kg
- (b)  3kg
- (c)  5kg

10. Which measurement is better?

- (a)  300 g or 300 kg 300g
- (b)  30 g or 30 kg 30kg
- (c)  1 m or 1 cm 1m

122 Chapter 4 test

**Using the Book** Each child should do this test independently under supervision. Assistance should be given only when the instructions are not understood. After the work has been corrected, you should provide appropriate remedial work. You may wish to reteach if a large number of children had difficulty with a particular topic or concept.

The following chart will help in this regard. The specific objectives are listed in the Chapter Overview (see page 100).

An alternate Chapter Test can be found in the Holt Mathematics System Duplicating Masters available for use with this grade level.

| Test Item          | Objective | Text Page Number   |
|--------------------|-----------|--------------------|
| 1-5                | A         | 107                |
| 6, 7, 10(c)        | B         | 109, 112           |
| 8, 9, 10(a), 10(b) | C         | 110, 118, 119, 120 |



# Cumulative Review

## OBJECTIVE

To review and test selected concepts and skills previously covered

Add.

|   |  |  |   |   |
|---|--|--|---|---|
| 1. $\begin{array}{r} 23 \\ + 56 \\ \hline 79 \end{array}$ | 2. $\begin{array}{r} 3 \\ 4 \\ + 6 \\ \hline 13 \end{array}$ | 3. $\begin{array}{r} 56 \\ + 98 \\ \hline 154 \end{array}$ | 4. $\begin{array}{r} 357 \\ + 968 \\ \hline 1325 \end{array}$ | 5. $\begin{array}{r} 524 \\ + 476 \\ \hline 1000 \end{array}$ |
|---|--|--|---|---|

Subtract.

|   |   |  |  |  |
|---|---|--|--|--|
| 6. $\begin{array}{r} 64 \\ - 31 \\ \hline 33 \end{array}$ | 7. $\begin{array}{r} 54 \\ - 28 \\ \hline 26 \end{array}$ | 8. $\begin{array}{r} 347 \\ - 116 \\ \hline 231 \end{array}$ | 9. $\begin{array}{r} 514 \\ - 266 \\ \hline 248 \end{array}$ | 10. $\begin{array}{r} 700 \\ - 622 \\ \hline 78 \end{array}$ |
|---|---|--|--|--|

Match.

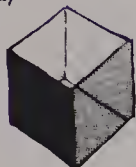
11. pyramid (b)

12. cube (a)

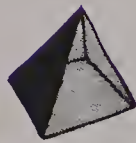
13. triangular prism (d)

14. cylinder (c)

(a)



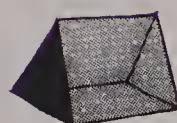
(b)



(c)



(d)



15. Jill measured a flower.  
It was 137 cm tall on Monday.  
On Tuesday it was 142 cm.  
How much did it grow? **5 cm**

17. Trace the shape.  
Mark the line of symmetry.



16. Peg planted 46 sweet peas on Monday.  
On Tuesday she planted 58 more.  
How many altogether did she plant? **104**

Chapters 1 - 4: cumulative review 123

**Using the Book** This page may be used for diagnostic and remedial as well as review purposes. Children should check their work, correct any errors, and review the pages that contain any problems of the type they missed. Some children can do this on their own while others may need help. If a large number of children have a particular problem incorrect, you may want to reteach that topic to the groups, then assign a duplicated worksheet to reinforce that topic or refer to an appropriate skill card in the BFA Computational Skills Kit I.

| Test Item | Text Page Number |
|-----------|------------------|
| 1, 3      | 40-47            |
| 2         | 31               |
| 4, 5      | 50-53            |
| 6, 7      | 56-63            |
| 8-10      | 67-70            |
| 11-14     | 83-85            |
| 15, 16    | 117              |
| 17        | 90-91            |

# CHAPTER 5 OVERVIEW

This chapter includes an introduction to working with fractions and decimals; a review and extension of length, mass, and capacity; and extends the use of money to include addition and subtraction of dollars and cents.

## OBJECTIVES

- A To write the fraction and/or decimal for the shaded portion of a whole unit
- B To compare fractions and decimals
- C To write the decimal given the number of wholes and tenths
- D To add and subtract decimals (tenths with sums less than one)
- E To estimate mass and capacity of objects
- F To add and subtract dollars and cents, and to make change
- G To write and interpret values greater than one dollar using the standard form

## BACKGROUND

Fractions with numerators of 1 are called *unit fractions*. Unit fractions are compared by studying their denominators — the larger the denominator, the smaller the unit fraction.

The decimals studied in this chapter are treated as a way of writing tenths. Note that while the understanding of decimals is developed from the concept of fractions, operations with decimals are developed before operations with fractions.

Every fraction has an infinite number of names. For example,  $\frac{1}{4} = \frac{2}{8}, \frac{3}{12}, \frac{4}{16}, \frac{5}{20}, \dots$ . Fractional names for the same numbers are called *equivalent fractions*.

Children are encouraged to make change by counting from the price to the amount tendered. The amount of the change can be calculated by subtraction:  
amount tendered – cost of item.

## MATERIALS

paper plates or discs  
containers of various capacities including 1 L and 0.5 L

objects of various masses including 1 kg and 0.5 kg  
play money of common coins and \$1, \$2, \$5, and \$10 bills

## CAREER AWARENESS

### Fruit Farmers [141]

Orchards are more important than ever for the production of food. The fruit farmer today must produce fruit efficiently and this means having high-yielding quality crops at minimal costs.

Many fruit farmers have spent all their lives in the orchard business. Some have taken training in agricultural schools and specialized in those areas most related to fruit and its production.

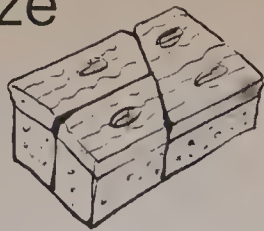
To keep an orchard in good production requires hard labour — intensive work. In the winter the trees are pruned and tended. In the growing season the fruit farmer cultivates the orchard, checks the trees and blossoms, sprays for insects and diseases, irrigates, and supports branches heavily laden with fruit. In harvest time farmers must get the fruit picked. Often labourers are hired to do this. More and more specialized machinery is being used to do many of the manual jobs.

Fruit farming, like farming of all kinds, has a certain risk factor. A good crop is dependent on many aspects of the weather — a late frost can kill the flowers and buds so no fruit is produced; an early frost or a wet harvest can damage fruit so it is not marketable; high winds, heavy rains, or hail can damage crops.

It is very expensive to get established in the fruit farming business. It takes years to develop a consistently productive orchard. Modern machinery which replaces costly and hard-to-get human labour, is in itself very expensive. At times orchards must be torn up and new trees planted to keep up with the new varieties which are higher yielders, more resistant to disease and insects, or better tasting and more appealing to the eye.



3 parts  
all the same size.



3 parts  
not all the same size.

## The Same Size

Which are cut into pieces of the same size?

1. (a) yes (b) no (c) yes (d) no

2. (a) yes (b) yes (c) no (d) yes

3. (a) yes (b) yes (c) yes (d) no

4. (a) yes (b) no (c) no (d) no

Identifying equal parts 125

**Using the Book** In discussing the display, emphasize that the first illustration represents fractions — thirds — since it is divided into three equal parts. In the second, the parts are not equal so it does not represent the fraction thirds.

This page should be done orally. It will help to identify those who have difficulty recognizing equal parts.

## OBJECTIVE

To identify objects that have been divided into equal parts

## PACING

Level A All  
Level B All  
Level C All

## VOCABULARY

pieces

## BACKGROUND

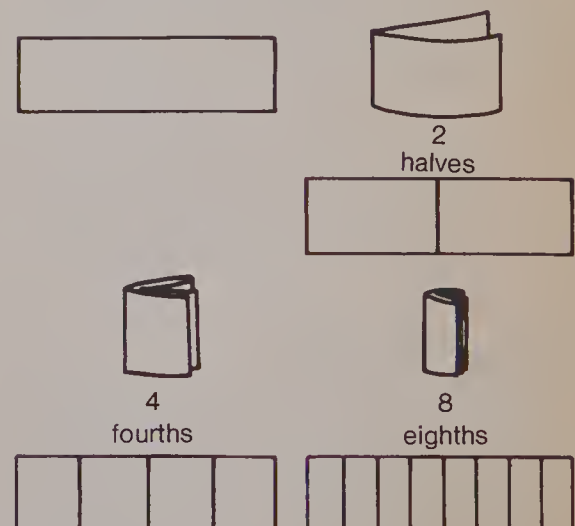
A basic concept of fractions of a whole is that the whole is divided into parts. A whole divided into three parts is *not* sufficient to provide thirds — a second condition is that the parts must be of equal sizes. The child needs to be able to recognize when an object is divided into equal parts.

## SUGGESTIONS

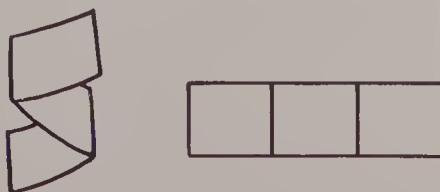
**Initial Activity** Prepare several pie plates, some cut into equal parts, others cut into unequal parts. Have various children identify the pie-plate pieces as being either equal or unequal. Demonstrate that sometimes we have to put one piece on top of another in order to tell. Make sure that the fraction names (i.e., one half, thirds, eighths, etc.) are used in the discussion for equal-sized pieces.

## ACTIVITIES

1. Have each child fold a strip of paper into 2, 4, and 8 equal parts by successive folds. Mark the fold marks.



Thirds are folded like this:



envelope or box top or other container appropriately labelled "equal parts" or "unequal parts".

3. As an added treat and a valuable demonstration, have on hand several pieces of fruit. While cutting the fruit discuss sharing and the value of equal pieces.

2. Provide prepared cards some of which show fractions and some of which show objects partitioned into unequal parts. Children are to select each picture card and place into an



## OBJECTIVE

To identify and write the unit fractions

$$\frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \dots, \frac{1}{10}$$

## PACING

Level A All

Level B All

Level C All

## VOCABULARY

fractions, shaded

## MATERIALS

paper and crayons

## RELATED AIDS

BFA COMP LAB I—70, 71.

## BACKGROUND

A fraction (fractional numeral) having a numerator of 1 is called a unit fraction.

## SUGGESTIONS

**Initial Activity** Using the strips folded in previous lesson (for example, the fourths), direct the children to colour one section. Then ask:

How many parts are coloured?  $\rightarrow \frac{1}{4}$

How many parts of the same size?  $\rightarrow 4$

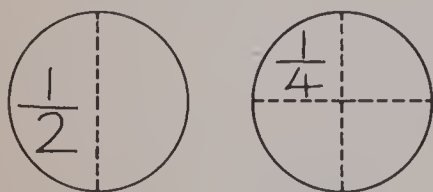
This is the fraction "one fourth".

Repeat for the other folded strips.

To emphasize that fractions can take other shapes, use a rectangular piece of paper and have the children fold and mark one half and one fourth.



Also provide the children with circular regions to fold and label one half and one fourth.



## ACTIVITIES

1. Start a bulletin board display of fractions. Some of the children's works should be displayed. Some children can be encouraged to make all the unit fractions from  $\frac{1}{2}$  to  $\frac{1}{10}$ . Use one size of paper for these unit fractions so they can be used in the next lesson.

2. Ask children to collect pictures from magazines that show fractions. Post a selection on the bulletin board

## Fractions

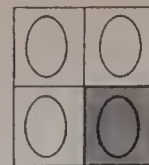


Number of shaded parts  $\rightarrow 1$

Number of parts of same size  $\rightarrow 2$

$\frac{1}{2}$  is shaded.

One half is shaded.



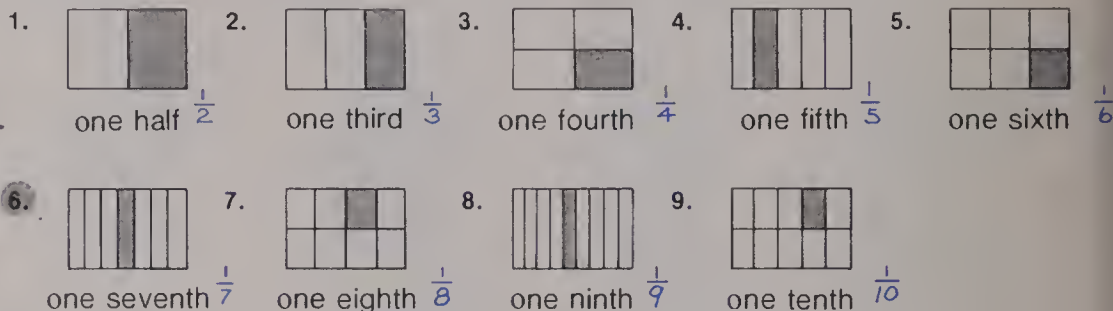
Number of shaded parts  $\rightarrow 1$

Number of parts of same size  $\rightarrow 4$

$\frac{1}{4}$  is shaded.

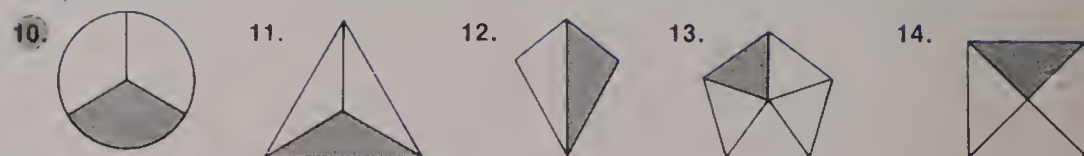
One fourth is shaded.

Write the fraction for each.



Write the fraction for the red parts.

Then write the word for each fraction.  $\frac{1}{2}$ , one half  $\frac{1}{5}$ , one fifth  $\frac{1}{4}$ , one fourth



126 Fractions

**Using the Book** Direct the children to the display and discuss  $\frac{1}{2}$  and  $\frac{1}{4}$  as described there. Emphasize that the number of shaded parts is the top number (numerator) and the number of parts altogether is the bottom number (denominator).

As you assign the exercises, be sure children are aware

- of instructions
- of answer format
- that answers are in the back pages for Exercises 6 and 10.

with the name of the fraction written two ways.

3. Play *Snap* using two decks of cards, one of pictures and the other of names of unit fractions.

# Comparing Fractions

>  
is greater than



<  
is less than

$$\frac{1}{2}$$

>

$$\frac{1}{4}$$

- Which is greater?  
 $\frac{1}{2}$  or  $\frac{1}{3}$   $\frac{1}{2}$



- Compare. Use > or <.

(a)  $\frac{1}{2}$  ●  $\frac{1}{5}$  >

(b)  $\frac{1}{5}$  ●  $\frac{1}{2}$  <



3. Compare. Use > or <.

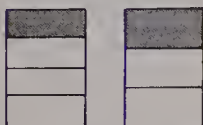
(a)  $\frac{1}{3}$  ●  $\frac{1}{2}$  <



(b)  $\frac{1}{2}$  ●  $\frac{1}{5}$  >



(c)  $\frac{1}{4}$  ●  $\frac{1}{3}$  <



(d)  $\frac{1}{3}$  ●  $\frac{1}{10}$  >



(e)  $\frac{1}{10}$  ●  $\frac{1}{4}$  <



(f)  $\frac{1}{2}$  ●  $\frac{1}{10}$  >



Comparing fractions 127

**Using the Book** Use the paper pie plates and the parts to demonstrate  $\frac{1}{2} > \frac{1}{4}$  by placing a one-half piece in an empty plate, a one-quarter piece in another empty plate, and asking:

What fraction is this? (one half)

What fraction is this? (one quarter)

Which is greater? (one half)

Repeat with other unit fractions.

Guide the children to generalize from *pictures or models*: the fraction with the smaller bottom number is the greater.

## OBJECTIVE

To compare unit fractions

## PACING

Level A All

Level B All

Level C All

## VOCABULARY

compare

## MATERIALS

paper pie plates:

1 coloured red and cut into halves

1 coloured blue and cut into thirds

1 coloured yellow and cut into fourths

1 coloured green and cut into fifths

1 coloured purple and cut into tenths

2 wholes — white

## RELATED AIDS

HMS—DM38.

## BACKGROUND

Note: You may want to use the terms “numerator” and “denominator” interchangeably with “top number” and “bottom number” but use the terms with discretion and only where it is obvious the child will understand what is meant by them. Do not expect children to use the terms.

## ACTIVITIES

1. Use the unit fractions the children made for the bulletin board display in the previous lesson. Ask the child to tell which is greater:  $\frac{1}{2}$  or  $\frac{1}{3}$ ;  $\frac{1}{2}$  or  $\frac{1}{5}$ ;  $\frac{1}{5}$  or  $\frac{1}{7}$ ;  $\frac{1}{7}$  or  $\frac{1}{9}$ .

2. Use the unit fraction models to make and compare each of these pairs.

(a)  $\frac{1}{3}$  ●  $\frac{2}{3}$  (b)  $\frac{1}{4}$  ●  $\frac{3}{4}$  (c)  $\frac{4}{5}$  ●  $\frac{1}{5}$

(d)  $\frac{1}{10}$  ●  $\frac{3}{10}$  (e)  $\frac{3}{5}$  ●  $\frac{2}{5}$  (f)  $\frac{3}{10}$  ●  $\frac{7}{10}$

(g)  $\frac{2}{4}$  ●  $\frac{3}{4}$  (h)  $\frac{1}{5}$  ●  $\frac{3}{5}$  (i)  $\frac{5}{10}$  ●  $\frac{6}{10}$

★3. Use the fraction models to make and compare each pair.

(a)  $\frac{1}{2}$  ●  $\frac{1}{4}$  (b)  $\frac{1}{3}$  ●  $\frac{2}{4}$  (c)  $\frac{1}{2}$  ●  $\frac{5}{10}$

(d)  $\frac{5}{10}$  ●  $\frac{1}{2}$  (e)  $\frac{2}{5}$  ●  $\frac{1}{10}$  (f)  $\frac{4}{10}$  ●  $\frac{3}{5}$

## OBJECTIVE

To write a fraction for the shaded parts of a picture

## PACING

Level A All  
Level B All  
Level C All

## MATERIALS

the fraction models made from paper pie plates as described in the previous lesson

## RELATED AIDS

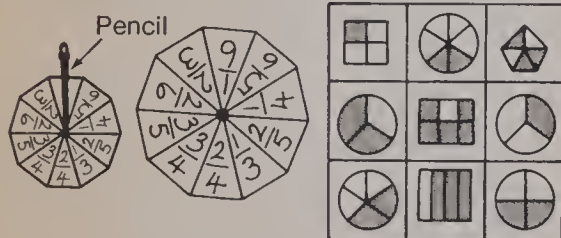
HMS—DM38.

## BACKGROUND

Fractions can express the relationship of the parts to the whole. The number of parts identified (shaded) is the numerator and the number of parts in all is the denominator. If two of the five parts are shaded, the fraction  $\frac{2}{5}$  expresses the ratio of the shaded parts to the whole.

## ACTIVITIES

1. Make this game board and spinner. Each player takes turns spinning the spinner. Player places marker on the corresponding space on the board. Player cannot play in space already occupied. Winner: First to get three markers in a row.



2. Write each on a card and challenge the children to unscramble each name of a fraction.

|         |           |
|---------|-----------|
| frthou  | (fourth)  |
| gehhit  | (eighth)  |
| vethesn | (seventh) |
| tixsh   | (sixth)   |
| thiff   | (fifth)   |
| tinnh   | (ninth)   |
| flah    | (half)    |
| driht   | (third)   |
| hentt   | (tenth)   |

3. Prepare matching pairs of cards such as



## Parts of a Whole



Number of blue parts  $\longrightarrow \frac{2}{3}$   
Number of parts  $\longrightarrow \frac{2}{3}$

$\frac{2}{3}$  is blue.

Two thirds is blue.

1. (a) How many red parts? 2  
(b) How many parts altogether? 4  
(c) What fraction of the shape is red?  $\frac{2}{4}$



Write a fraction for the coloured part in each.

2.  $\frac{2}{3}$  3.  $\frac{3}{4}$  4.  $\frac{2}{5}$  5.  $\frac{3}{8}$   
6.  $\frac{2}{6}$  7.  $\frac{3}{4}$  8.  $\frac{1}{2}$  9.  $\frac{1}{3}$   
10.  $\frac{3}{8}$  11.  $\frac{5}{10}$  12.  $\frac{6}{10}$  13.  $\frac{3}{10}$

128 Fractional parts of a whole

**Using the Book** Follow the pattern as described on page 126.

This page may be done orally with children writing the answers either at the chalkboard or in their exercise books before the individual answers are given aloud.

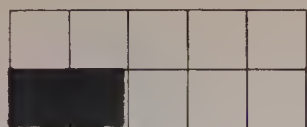
You may wish to combine pages 128 and 129 into one day's work.



Display them mixed up on the bulletin board or chalkboard in two columns. Have children match the correct pairs by using string or yarn to connect the appropriate cards.



# Tenths



Number of parts  $\rightarrow 10$   
Two parts  $\rightarrow$  two tenths  
 $\frac{2}{10}$

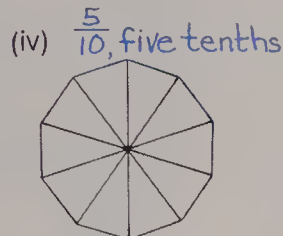
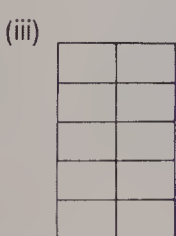
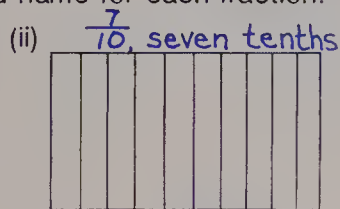
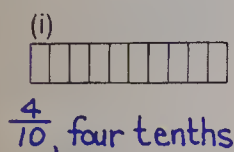


Number of parts  $\rightarrow 10$   
Four parts  $\rightarrow$  four tenths  
 $\frac{4}{10}$

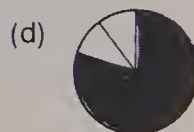
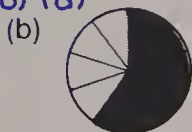
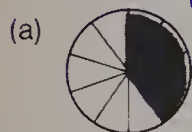
Write a fraction for the blue part.  $\frac{4}{10}$   
Write the word name. four tenths



2. (a) Write a fraction for the yellow part.  
(b) Write a word name for each fraction.



3. Which shows  $\frac{3}{10}$ ?  $\frac{6}{10}$ ?  $\frac{8}{10}$ ?  
(c) (b) (d)



Tenths 129

**Using the Book** Direct the children to look at the display at the top of the page or refer to the large demonstration chart arranged to show  $\frac{2}{10}$ . Ask how the rectangle is divided and how many parts there are. Then ask what the number 2 in  $\frac{2}{10}$  tells about the picture.

Ask a child to read " $\frac{2}{10}$ ".

Write "two tenths" on the chalkboard. Ask the children to write this in symbol form.

Write  $\frac{2}{10}$  on the chalkboard. Ask the children to write the word name for this fraction (two tenths).

Assign the page. You may wish to combine this page (129) with the previous page (128) into one lesson period.

the cards are not a match, they are turned back (information down) and the second child takes a turn. The players must concentrate to remember the information on the card previously

turned over to help them in making a match. The child with the most cards in a pile wins. As the children become adept, the number of cards in the array can be increased.

## OBJECTIVES

To write a fraction for the shaded parts of a whole unit picture divided into tenths

To write the word name for each fraction (limited to tenths)

## PACING

Level A All  
Level B All  
Level C All

## MATERIALS

(teaching aids)

The following two demonstration devices will be very useful in this chapter to illustrate various aspects of fractions and decimals.

1. Velcro glued on back

Make 10 of these to fit a large unit chart divided into tenths. Put Velcro on the unit chart also.

2. Velcro

Make 10 coloured sections to fit full disc — on which Velcro is also glued.

## RELATED AIDS

HMS—DM39.

## ACTIVITIES

1. Have the children write the word names for the fractions in Exercise 3.

2. Have the children draw geometric shapes, divide each shape into equal parts, and colour some of the parts. Children are to record on the back the fraction and word name for the part coloured. Children exchange shapes and identify in two ways the part shaded. They check by looking at the answer on the back.

3. Prepare a set of 20 cards, 10 of which have a fraction pictured, the other 10 containing the corresponding fraction name (e.g.,  $\frac{2}{3}$ ,  $\frac{4}{10}$ , etc.).

Have the children play Concentration. The cards are placed in an array with the information down. The first player turns over two cards. If the cards match, the child takes both cards. If

## OBJECTIVES

To write tenths using decimal notation  
To write decimal fractions for parts of a region divided into tenths

## PACING

Level A 1-6  
Level B All  
Level C All

## VOCABULARY

renaming, decimal

## MATERIALS

the tenths models from the previous pages

## RELATED AIDS

HMS—DM39.

## SUGGESTIONS

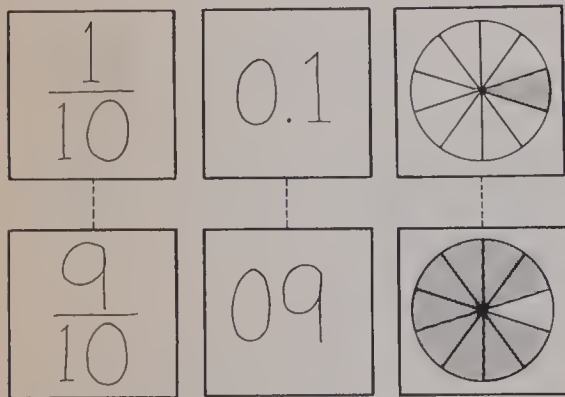
**Initial Activity** Ask the children to think of other names of common objects:

car — automobile,  
road — highway,  
ship — boat, etc.

Point out that when we use a different word for the same thing, we are simply "renaming it".

## ACTIVITIES

1. Make a deck of 27 cards:

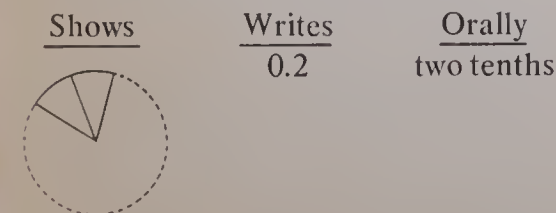


Play the game like Snap.

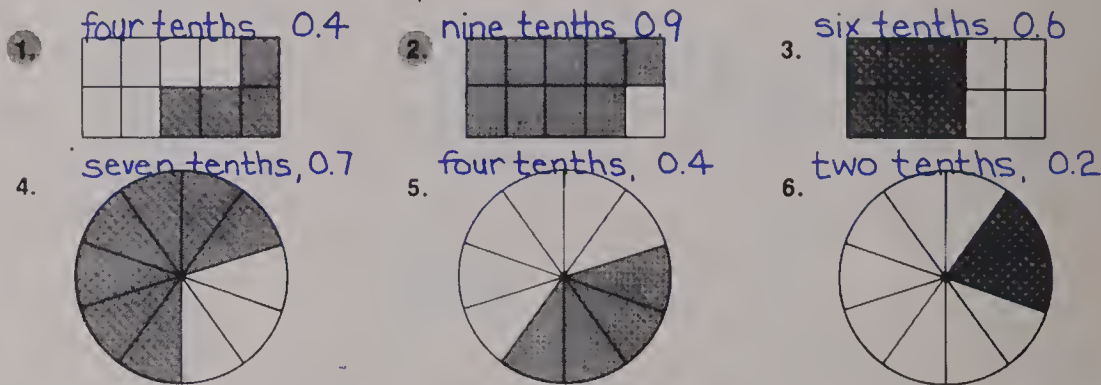
2. Use the set of discs described in the Materials on page 129.

Drill: As you put up combinations of the sectors, the child writes the decimal in exercise book. Children take turns saying the answers out loud for correction purposes.

Alternate: Child puts up sectors for the balance of the class and asks specific children for the answers.



Write two names for each red part.

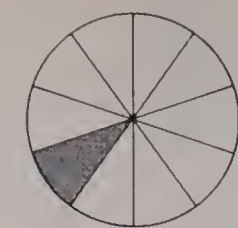


7. Write.

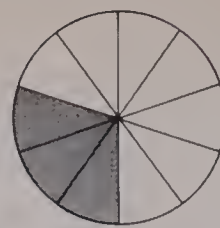
- (a) zero decimal one 0.1 (b) zero decimal three 0.3  
(c) zero decimal five 0.5 (d) zero decimal eight 0.8

130 Decimal notation

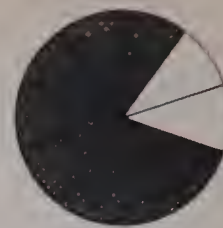
## Renaming Tenths



$$\frac{1}{10} \quad \text{one tenth} \\ 0.1$$



$$\frac{3}{10} \quad \text{three tenths} \\ 0.3$$



$$\frac{8}{10} \quad \text{eight tenths} \\ 0.8$$

0.3 is read: three tenths  
zero decimal three

**Using the Book** Have the children look at the display. Point out that we have other names for or can rename fractions, too. We can use decimals.

Emphasize we always put a zero to the left of (in front of) the decimal. Discuss each aspect of the display emphasizing how to read and write each way of writing the names for fractions.

3. Prepare a set of cards such as:

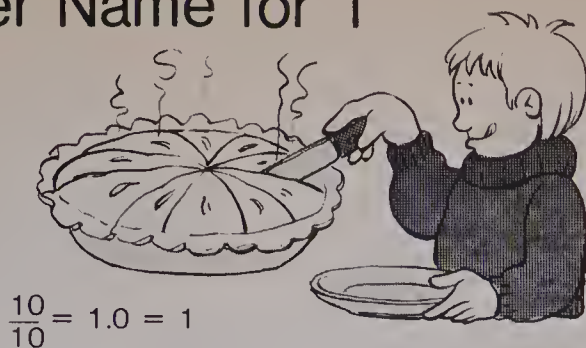
| Write word names for |                    |
|----------------------|--------------------|
| 0.3                  | zero decimal three |
| 0.7                  | zero decimal seven |
| 0.8                  | zero decimal eight |
| 0.1                  | etc.               |
| 0.9                  |                    |
| 0.5                  |                    |
| (front)              | (back)             |

Children take a card, and write answers on a paper strip beside card. By turning over and matching up, activity is easily self-checking. Activity such as this can also be used to match  $\frac{1}{10}$  to 0.1, etc.

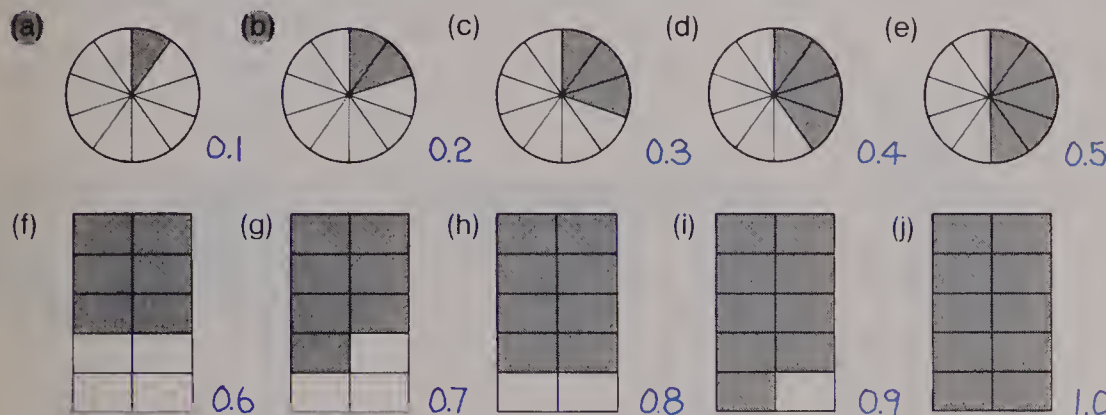


# Another Name for 1

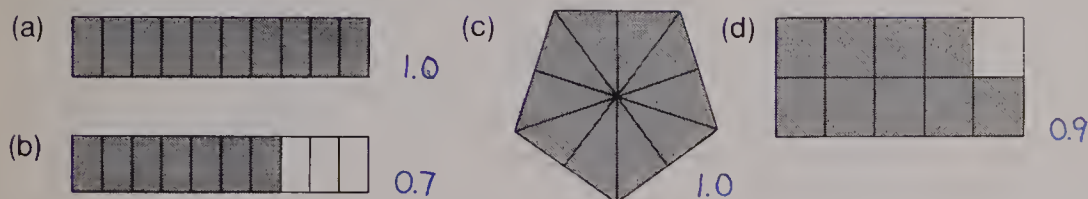
Joe has 1 pie.  
He cuts it into tenths.  
He has  $\frac{10}{10}$ .  
He has 1.0.



1. Write a decimal for each.



2. Write a decimal for the red parts.



Fractional equivalent of a whole 131

**Using the Book** Read or have read the information in the display. Draw to the children's attention that this simply tells what was shown in the initial activity. Emphasize that "one" can be written numerically three ways:

- (1)  $\frac{10}{10}$ ,  $\frac{4}{4}$ ,  $\frac{5}{5}$ ; (2) 1.0; (3) 1.

## EXTRA PRACTICE

★Copy and complete.

- (a)  $1 = \frac{\blacksquare}{2}$  (b)  $1 = \frac{\blacksquare}{4}$  (c)  $1 = \frac{\blacksquare}{5}$   
 (d)  $1 = \frac{\blacksquare}{3}$  (e)  $1 = \frac{\blacksquare}{10}$  (f)  $1 = \frac{\blacksquare}{7}$   
 (g)  $1 = \frac{5}{\blacksquare}$  (h)  $1 = \frac{10}{\blacksquare}$  (i)  $1 = \frac{9}{\blacksquare}$

## OBJECTIVE

To write the fraction  $\frac{10}{10}$  for 1 and 1 for  $\frac{10}{10}$ .

## PACING

Level A All  
Level B All  
Level C 1

## MATERIALS

the tenths models from page 129, the fraction wheels from page 127

## RELATED AIDS

BFA COMP LAB I—86.  
HMS—DM39.

## SUGGESTIONS

**Initial Activity** Show the whole paper pie plate as you place the coloured pieces in to fill the plate. Count the tenths as you do:

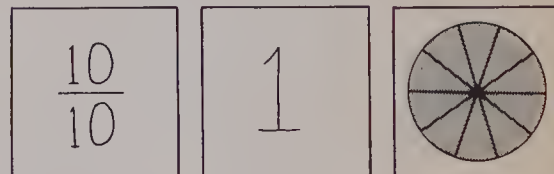
$\frac{1}{10}$ ,  $\frac{2}{10}$ , ...,  $\frac{9}{10}$ ,  $\frac{10}{10}$ .

Ask, "How many equal parts? How many coloured parts? How many tenths in 1?"

Repeat this with fourths, fifths, and any others necessary.

## ACTIVITIES

1. Add these three cards to the deck suggested in Activity 1 on page 130. Play Snap.

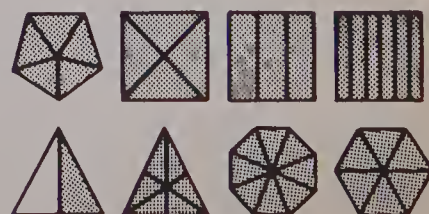


2. Use the Drill suggested in Activity 2 on page 130. Include the full circle. This time each child writes the fraction two ways.

0.3  $\frac{3}{10}$  Orally: three tenths

1  $\frac{10}{10}$  Orally: one (or) ten tenths

3. Provide these for the children on activity cards. Write a decimal for the shaded part.





## OBJECTIVE

To express units and tenths using decimal notation

## PACING

Level A 1-3  
Level B All  
Level C All

## MATERIALS

paper pie plates (page 127), tenths models (page 129)

## RELATED AIDS

HMS—DM39.

## ACTIVITIES

### 1. Drill:

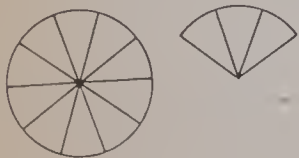
Ask the child to write each as a decimal as you dictate them.

- (1) two and three tenths
- (2) one and five tenths
- (3) six tenths
- (4) four and one tenth
- (5) six
- (6) one and two tenths
- (7) two and nine tenths
- (8) seven tenths
- (9) five and eight tenths
- (10) four and four tenths

2. For additional practice provide each pair of children with paper plate sectors. One child is to give the partner a number of tenths. The partner is to write a decimal.

3. Review the procedure in Activity 2. The first child writes a number and the second child constructs a model to illustrate the fraction using the tenth models, i.e., "one and three tenths".

Model:



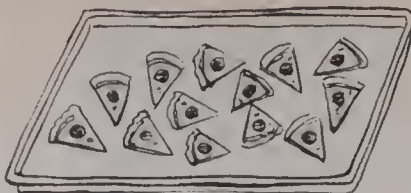
## EXTRA PRACTICE

★ Write a decimal for each.

- (a)  $1 + \frac{3}{10}$  (b)  $2 + \frac{4}{10}$  (c)  $4 + \frac{1}{10}$   
(d)  $2 + \frac{9}{10}$  (e)  $1 + \frac{8}{10}$  (f)  $4 + \frac{7}{10}$   
(g)  $3 + \frac{2}{10}$  (h)  $5 + \frac{6}{10}$

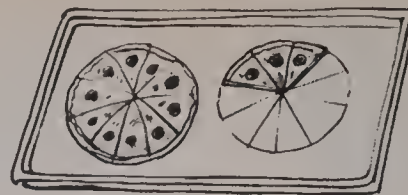
## Decimals Greater Than One

13 pieces of pizza left over.



Each piece is 0.1.

They were put together.

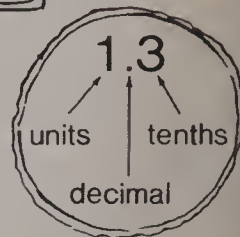


13 tenths

10 tenths + 3 tenths

1 whole + 3 tenths

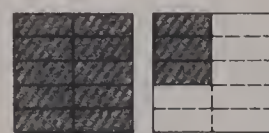
1.3



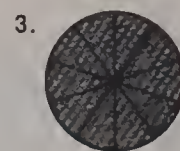
Write decimals.



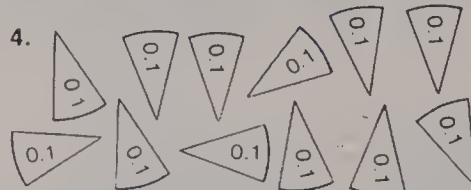
■ . ■ 1.4



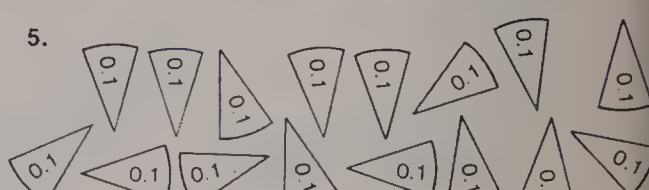
■ . ■ 1.3



■ . ■ 1.6



12 tenths = 10 tenths + 2 tenths  
= 1 whole + 2 tenths  
= 1.2



16 tenths = 10 tenths + 6 tenths  
= 1 whole + 6 tenths  
= 1.6

132 Place value, wholes and tenths

**Using the Book** Using the paper pie plates and sections, demonstrate the situation illustrated in the display.

Reinforce that 10 tenths is the same as 1.

Guide the children to always put 10 tenths in a pile and the balance of less than 10 in another pile.

Reinforce the decimal form of the fractions in tenths:  $\frac{2}{10} = 0.2$ .

Provide tenth models for Exercises 4 and 5 to any child who needs them.

# Adding Decimals

Mark had a pizza cut into tenths.

He gave Mary 0.2.

He gave Jill 0.3.

How much did he give away?

He gave 0.5 away.



$$\begin{array}{r} 0.2 \\ + 0.3 \\ \hline 0.5 \end{array}$$



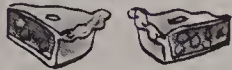
Adding decimals is like adding whole numbers.

1. George and Mary ate pie.

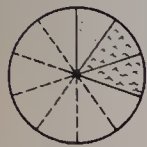
George ate 0.1.



Mary ate 0.2.



How much did they eat altogether?



$$\begin{array}{r} 0.1 \\ + 0.2 \\ \hline 0.3 \end{array}$$

They ate 0.3 of the pie.

2. Jill and Harry ate pizza.

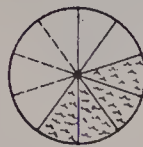
Jill ate 0.2.



Harry ate 0.4.



How much altogether?



$$\begin{array}{r} 0.2 \\ + 0.4 \\ \hline 0.6 \end{array}$$

3. Harriet and Bill ate pie.

Harriet ate 0.3.

Bill ate 0.4.



$$\begin{array}{r} 0.3 \\ + 0.4 \\ \hline 0.7 \end{array}$$

How much altogether?

4. Add.

|   |   |   |   |
|---|---|---|---|
| (a) $\begin{array}{r} 0.1 \\ + 0.2 \\ \hline 0.3 \end{array}$ | (b) $\begin{array}{r} 0.6 \\ + 0.2 \\ \hline 0.8 \end{array}$ | (c) $\begin{array}{r} 0.3 \\ + 0.5 \\ \hline 0.8 \end{array}$ | (d) $\begin{array}{r} 0.7 \\ + 0.2 \\ \hline 0.9 \end{array}$ |
|---|---|---|---|

Addition of decimals 133

**Using the Book** Read or have read the information contained in the display. When demonstrate this idea by placing 2 sectors of the tenths fraction wheel on the board. Say: "We have two tenths. I will add three tenths." (Place 3 more sectors on the board). "How much do we have now?"

Write:

$$\begin{array}{r} 0.2 \\ + 0.3 \\ \hline 0.5 \end{array}$$

The sums are restricted to one or less.)

If the children have difficulty, encourage them to use the fraction wheel or pie plates sectioned in tenths.

Discuss how adding decimals is like adding whole numbers, and how it is different.

Do Exercises 1, 2, and 3 orally. Tell the children to copy Exercise 4 in their books and add.

## OBJECTIVE

To add two decimal numbers in tenths whose sum is  $\leq 1$

## PACING

Level A All  
Level B All  
Level C All

## MATERIALS

fraction wheel (page 129), pie plates in tenths (page 127)

## RELATED AIDS

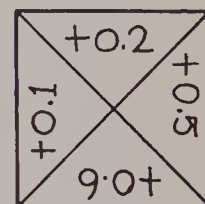
HMS—DM40.

## ACTIVITIES

1. Pairs of children working with tenth pie plate models take turns giving each other two sets of sectors. The receiving child writes an addition question and solves it.

2. Prepare two dice, one with 0.2, 0.3, 0.8, 0.6, 0.7, 0.1 and the other with 0.9, 0.7, 0.5, 0.4, 0.6, 0.8. Two or more children take turns rolling the two dice and adding the numbers that come up.

★3. Let the children play "The Facts Machine" in the Activity Reservoir. They should use the dice from Activity 2 and this spinner. They add all 3 numbers now.



## EXTRA PRACTICE

Have the child add:

- |   |   |   |
|---|---|---|
| 1. $\begin{array}{r} 0.3 \\ + 0.4 \\ \hline \end{array}$  | 2. $\begin{array}{r} 0.7 \\ + 0.1 \\ \hline \end{array}$  | 3. $\begin{array}{r} 0.2 \\ + 0.8 \\ \hline \end{array}$  |
| 4. $\begin{array}{r} 0.1 \\ + 0.9 \\ \hline \end{array}$  | 5. $\begin{array}{r} 0.2 \\ + 0.3 \\ \hline \end{array}$  | 6. $\begin{array}{r} 0.1 \\ + 0.5 \\ \hline \end{array}$  |
| 7. $\begin{array}{r} 0.2 \\ + 0.4 \\ \hline \end{array}$  | 8. $\begin{array}{r} 0.2 \\ + 0.6 \\ \hline \end{array}$  | 9. $\begin{array}{r} 0.3 \\ + 0.1 \\ \hline \end{array}$  |
| 10. $\begin{array}{r} 0.5 \\ + 0.3 \\ \hline \end{array}$ | 11. $\begin{array}{r} 0.5 \\ + 0.1 \\ \hline \end{array}$ | 12. $\begin{array}{r} 0.5 \\ + 0.2 \\ \hline \end{array}$ |

If a child solves the third question in the Extra Practice in the following manner refer him to the fraction wheel.

$$\begin{array}{r} 0.2 \\ + 0.8 \\ \hline 0.10 \end{array}$$



## OBJECTIVE

To subtract decimal numbers in tenths, the minuend  $\leq 1$

## PACING

Level A All  
Level B All  
Level C All

## MATERIALS

fraction wheel, pie plates in tenths

## RELATED AIDS

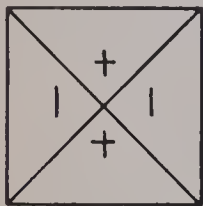
HMS—DM40.

## ACTIVITIES

1. Pairs of children working with tenth pie plate models take turns giving each other a set of sectors, then taking away some. The receiving children write a subtraction question and solve it.

2. Use the two dice from page 133. Two or more children take turns rolling the dice and subtracting the smaller number from the larger number.

3. Let the children play "The Facts Machine" from the Activity Reservoir. They should use the dice from Activity 2 and this spinner.



## EXTRA PRACTICE

Have the child subtract:

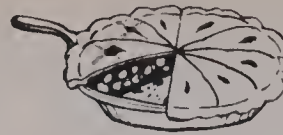
- |                           |                           |                           |
|---------------------------|---------------------------|---------------------------|
| 1. $1.0$<br>$- 0.3$<br>—  | 2. $0.3$<br>$- 0.1$<br>—  | 3. $0.8$<br>$- 0.7$<br>—  |
| 4. $0.8$<br>$- 0.2$<br>—  | 5. $1.0$<br>$- 0.8$<br>—  | 6. $0.8$<br>$- 0.1$<br>—  |
| 7. $0.8$<br>$- 0.6$<br>—  | 8. $0.9$<br>$- 0.7$<br>—  | 9. $1.0$<br>$- 0.5$<br>—  |
| 10. $0.3$<br>$- 0.2$<br>— | 11. $0.5$<br>$- 0.3$<br>— | 12. $0.6$<br>$- 0.2$<br>— |
| 13. $0.7$<br>$- 0.3$<br>— | 14. $0.5$<br>$- 0.1$<br>— | 15. $0.5$<br>$- 0.2$<br>— |
| 16. $0.5$<br>$- 0.4$<br>— | 17. $0.7$<br>$- 0.1$<br>— | 18. $0.6$<br>$- 0.5$<br>— |
| 19. $0.7$<br>$- 0.5$<br>— | 20. $0.4$<br>$- 0.3$<br>— | 21. $0.7$<br>$- 0.2$<br>— |

## Subtracting Decimals

Mark had 0.8 of a pie.

He ate 0.2 of the pie.

How much is left?



$$\begin{array}{r} 0.8 \\ - 0.2 \\ \hline 0.6 \end{array}$$

0.6 of the pie is left.

Subtracting decimals is like subtracting whole numbers.

1. Liz had 0.7 of a pie.  
She ate 0.3 of the pie.  
How much is left?

$$\begin{array}{r} 0.7 \\ - 0.3 \\ \hline 0.4 \end{array}$$



0.4 of the pie is left.

2. Marge had 0.8 of a pizza.  
She ate 0.4 of the pizza.  
How much is left?

$$\begin{array}{r} 0.8 \\ - 0.4 \\ \hline 0.4 \end{array}$$



0.4 of the pizza is left.

3. Bill had 0.6 of a pie.  
He ate 0.2 of the pie.  
How much is left?

$$\begin{array}{r} 0.6 \\ - 0.2 \\ \hline 0.4 \end{array}$$



0.4 of the pie is left.

4. Subtract.

|                           |                           |                           |
|---------------------------|---------------------------|---------------------------|
| (a) $0.6$<br>$- 0.1$<br>— | (b) $0.5$<br>$- 0.3$<br>— | (c) $0.7$<br>$- 0.4$<br>— |
| 0.5                       | 0.2                       | 0.3                       |
| (d) $0.8$<br>$- 0.6$<br>— | (e) $0.9$<br>$- 0.5$<br>— | (f) $0.8$<br>$- 0.5$<br>— |
| 0.2                       | 0.4                       | 0.3                       |

134 Subtraction of decimals

**Using the Book** After having read and discussed the display with the children, prepare the following demonstration.

Place 8 sectors of the tenths fraction wheel on the board.

Say: "Mark has eight tenths of a pie. He ate two tenths of the pie." (Take 2 sectors away.) "How much pie is left?"

Write:

$$\begin{array}{r} 0.8 \\ - 0.2 \\ \hline 0.6 \end{array}$$

To do this one:

$$\begin{array}{r} 1.0 \\ - 0.3 \\ \hline \end{array}$$

Repeat the procedure above. It is suggested you do not talk about *regrouping* at this stage.

Discuss how subtracting decimals is like subtracting whole numbers, and how it is different.

Do Exercises 1, 2, and 3 orally remembering to finish each question with a sentence. Direct the children to copy Exercise 4 in their books and subtract.

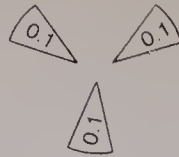


# Activity

Use 3 paper plates each cut into 10 equal parts.

Mark several paper plates in tenths.

Fit tenths into the whole plates to show the sums.

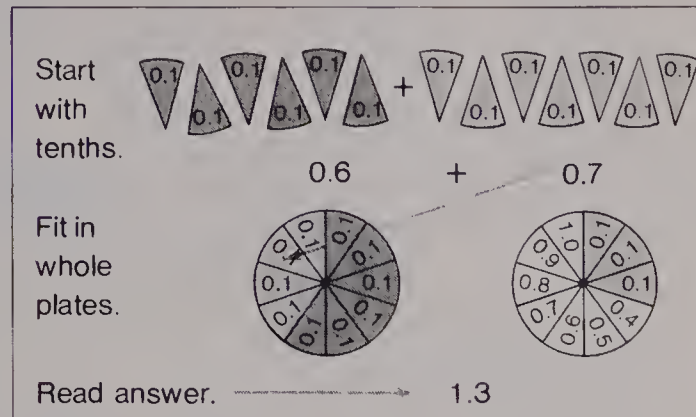


To add:

$$0.6 + 0.7 = \blacksquare 1.3$$

Use this method to add.

1.  $0.8 + 0.9 = \blacksquare 1.7$
2.  $1.2 + 0.7 = \blacksquare 1.9$
3.  $0.6 + 0.8 = \blacksquare 1.4$
4.  $0.5 + 0.8 = \blacksquare 1.3$
5.  $0.5 + 1.4 = \blacksquare 1.9$
6.  $1.3 + 0.5 = \blacksquare 1.8$

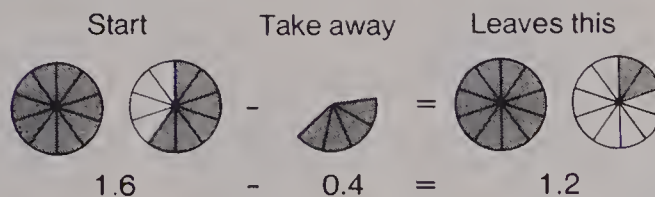


To subtract:

$$1.6 - 0.4 = \blacksquare 1.2$$

Use this method to subtract:

7.  $1.8 - 0.5 = \blacksquare 1.3$
8.  $1.6 - 0.9 = \blacksquare 0.7$
9.  $1.4 - 0.7 = \blacksquare 0.7$
10.  $1.9 - 0.3 = \blacksquare 1.6$
11.  $1.8 - 1.3 = \blacksquare 0.5$



Decimal activity 135

**Using the Book** Group the children and provide each group with the materials. Have the children check each other's work. Have each child write a number sentence for each problem done.

## OBJECTIVE

To add and subtract decimals in horizontal form using fraction pieces

## PACING

Level A All  
Level B All  
Level C All

## VOCABULARY

several, method

## MATERIALS

per group or station: 3 paper plates coloured and cut into tenths, 2 full paper plates marked in tenths, paper plates and sections as described on page 127

## RELATED AIDS

HMS—DM41.

## ACTIVITIES

1. Have the child practise addition of decimals by using the "Shape Pictures" in the Activity Reservoir. Numbers on the shapes should be decimals as illustrated on page 135.

2. Challenge the child to answer each question and use the code to answer the riddle:

What is another name for a dentist's office?

|     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1.0 | 0.7 | 0.8 | 1.6 | 1.1 | 1.8 | 0.9 | 1.3 | 1.5 |
| F   | L   | A   | N   | S   | T   | O   | G   | I   |

- |                 |                 |                 |
|-----------------|-----------------|-----------------|
| 1. $0.4 + 0.4$  | 2. $0.8 + 0.2$  | 3. $1.2 + 0.3$  |
| 4. $1.6 - 0.9$  | 5. $1.3 - 0.6$  | 6. $0.6 + 0.9$  |
| 7. $0.8 + 0.8$  | 8. $0.7 + 0.6$  | 9. $0.4 + 0.7$  |
| 10. $1.2 + 0.6$ | 11. $0.1 + 0.7$ | 12. $0.9 + 0.9$ |
| 13. $1.8 - 0.3$ | 14. $1.2 - 0.3$ | 15. $1.7 - 0.1$ |

3. HMS—DM41.

## EXTRA PRACTICE

(Child only needs to use the fraction pieces when he does not know the answer.)

Add.

- |                                |                                |
|--------------------------------|--------------------------------|
| 1. $0.2 + 0.4 = \blacksquare$  | 2. $0.6 + 0.4 = \blacksquare$  |
| 3. $1.4 + 0.5 = \blacksquare$  | 4. $0.2 + 1.3 = \blacksquare$  |
| 5. $1.1 + 0.2 = \blacksquare$  | 6. $1.2 + 0.5 = \blacksquare$  |
| 7. $0.3 + 0.9 = \blacksquare$  | 8. $1.2 + 0.4 = \blacksquare$  |
| 9. $0.5 + 1.6 = \blacksquare$  | 10. $0.8 + 0.7 = \blacksquare$ |
| 11. $0.7 + 0.7 = \blacksquare$ | 12. $0.3 + 1.4 = \blacksquare$ |

Subtract.

- |                                |                                |
|--------------------------------|--------------------------------|
| 1. $1.4 - 0.1 = \blacksquare$  | 2. $1.2 - 0.6 = \blacksquare$  |
| 3. $1.7 - 0.9 = \blacksquare$  | 4. $1.5 - 0.8 = \blacksquare$  |
| 5. $1.2 - 0.5 = \blacksquare$  | 6. $1.3 - 0.7 = \blacksquare$  |
| 7. $1.6 - 0.2 = \blacksquare$  | 8. $1.8 - 0.4 = \blacksquare$  |
| 9. $1.8 - 0.9 = \blacksquare$  | 10. $1.4 - 0.8 = \blacksquare$ |
| 11. $1.5 - 1.4 = \blacksquare$ | 12. $1.6 - 1.1 = \blacksquare$ |

## OBJECTIVE

To solve a picture-word problem involving fractions and decimals

## PACING

Level A All  
Level B All  
Level C All

## SUGGESTIONS

**Initial Activity** In applying mathematics to real-life situations, children learn to relate what they study to everyday happenings. Mathematics then becomes meaningful.

You might ask children into how many parts their parents cut a pie. (It may vary depending on the number in the family.) Then discuss how many thirds, fifths, etc., are in 1 pie. If a pie is cut into fifths and one piece is taken out, how much is left? Continue this type of discussion parallel to the questions on this page.

## ACTIVITIES

1. Ask each child to make up one problem similar to the types on this page. Each writes a problem and draws a picture on a page for posting on the bulletin board. (Answers are to be placed on the back.) The child takes problems from the board and does them.

2. Prepare a deck of 20 cards which contain 10 pairs of matching cards — one containing a decimal number, the other its fraction name.

Have the children play Concentration, the general rules for which are in Activity 3, page 129.

3. Prepare a blank  $3 \times 3$  grid and distribute one to each child. Have children write a decimal (between say 0.1 and 1.9) in each blank space in a random order so that each child has a personalized grid.

|     |     |     |
|-----|-----|-----|
| 0.1 | 0.7 | 1.3 |
| 0.9 | 0.8 | 0.6 |
| 0.2 | 1.0 | 0.5 |

Circulate to be sure (a) no one has gone too high, and (b) on one has written a number twice.

Play Bingo in the usual manner.

## The Coffee Shop

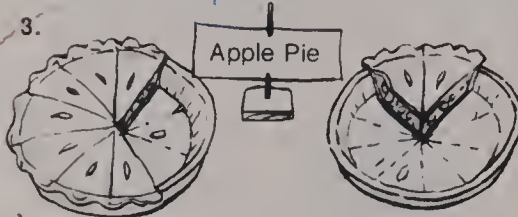
Sharon is helping her Father and Mother in their coffee shop.



Write a fraction for the pie left.  $\frac{3}{4}$

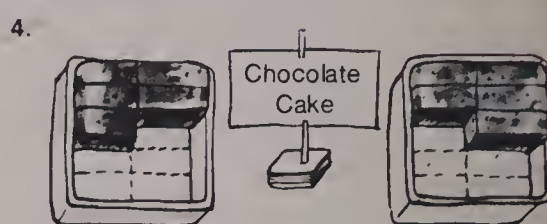


Write a decimal for the pie left. 0.6



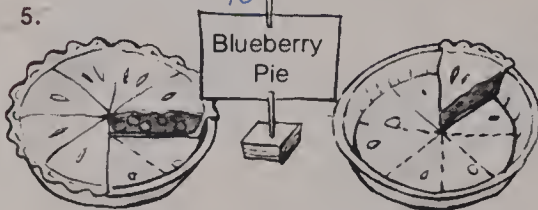
How many tenths of each apple pie is left?  $\frac{7}{10}$  and  $\frac{8}{10}$

How much apple pie is left altogether?  $\frac{9}{10}$

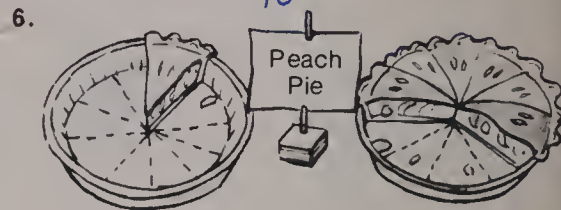


How many tenths of each chocolate cake is left?  $\frac{7}{10}$  and  $\frac{8}{10}$

How much chocolate cake is left altogether?  $\frac{10}{10}$



How much blueberry pie is left?  $\frac{7}{10}$



How much peach pie is left?  $\frac{7}{10}$   
Write the answer as a decimal. 0.7

136 Fraction and decimal problems

**Using the Book** Assign the page and move about checking the children's work. Some children with a weakness in reading may profit from a reading lesson — especially with Exercises 3 and 4. If children are required to record their answers in a workbook or sheet, be sure they are clear as to the preferred method for doing so.



# Guessing Amounts of Liquids



Select a variety of containers.

Use 1 L and one half litre (0.5 L) containers.



1. Guess the amount the smallest container will hold.  
Check your answer. Were you close?
2. Guess and check the amount each of the other containers will hold.  
Work from the smallest to the largest.  
Did your guess improve?

Capacity, the litre 137

**Using the Book** Review the symbol for litre (L) and the expression for one = half litre (0.5 L).

Each child or group of children should guess the capacity for each container one at a time. The guess should then be checked before proceeding to the next one. The guesses should improve as they practise. Start with the smallest and work to the largest.

If space is limited, one child can fill a container with water and pour it into the litre and half litre containers — while the others watch.

Each child takes a turn.

## OBJECTIVE

To estimate quantities of liquid in litres and half litres

## PACING

Level A All  
Level B All  
Level C All

## MATERIALS

1 L and 0.5 L containers labelled, a variety of containers, bird seed or water

## ACTIVITIES

1. Ask children to make a list of containers at home along with their capacities.

Discuss these lists in class. A number of containers will be labelled in millilitres (mL) so this will lead naturally into the lesson on the next page. ★ Also this can lead into rounding for some cans may be labelled 675 mL. Is this closer to 500 mL (0.5 L) or 1000 mL (1 L)?

2. Provide the children with larger containers: 2 L, 3 L, 4 L. They should find the capacity of each using the 1 L container. They can copy and complete this chart.

|                       |   |   |   |   |
|-----------------------|---|---|---|---|
| Number of litres      | 1 | 2 | 3 | 4 |
| Number of half litres |   |   |   |   |



OBJECTIVES

To develop an intuitive feeling for a litre capacity and for smaller parts of a litre  
To identify the number of millilitres in a litre

PACING

- Level A 1-3
- Level B All
- Level C All

VOCABULARY

millilitre (mL), container

MATERIALS

2 L milk carton for each group, a variety of containers ranging from 10 mL to 2 L, a medicine dropper for each group of 2 in the class, water or puffed rice or bird seed

BACKGROUND

1 L = 1000 mL (one litre equals one thousand millilitres).  
15 drops from an average medicine dropper is about 1 mL.  
If a sink is not available in the room, bird seed or puffed rice will work equally as well and doesn't grit as badly as sand or salt.

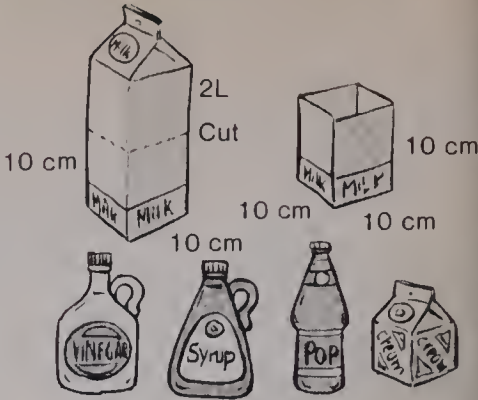
ACTIVITIES

- Have children use cream cartons to make 0.5 L containers. Ask, "How many 0.5 L are needed to fill 2 L? 3 L? 4 L?"
- Use "Metric Bingo" in the Activity Reservoir. Limit the playing cards to units covered by your class to date: metre, centimetre, decimetre, kilometre, gram, kilogram, litre, millilitre.
- Have the children make this Tic Tac Toe board. In order for a player to place a marker in a square, the player must identify the correct symbol.

|                                 |  |  |
|---------------------------------|--|--|
| 0.5 L<br>(<, =, >)<br>0.1 L     | one and one tenth litres<br>(<, =, >)<br>1.1 L | one litre<br>(<, =, >)<br>ten tenths litre |
| one litre<br>(<, =, >)<br>1.1 L | 0.5 L<br>(<, =, >)<br>one tenth litre          | 0.3 L<br>(<, =, >)<br>0.6 L                |
| 0.5 L<br>(<, =, >)<br>0.7 L     | 1.3 L<br>(<, =, >)<br>0.9 L                    | 0.5 L<br>(<, =, >)<br>1 L                  |

Litres and Millilitres

- Make a 1 L container. (one litre)
  - Use a 2 L milk carton.
  - Cut it off 10 cm from the bottom.

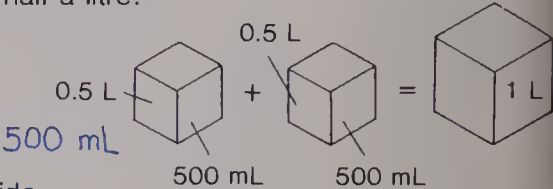


- Use different containers.  
About how many litres does each hold?

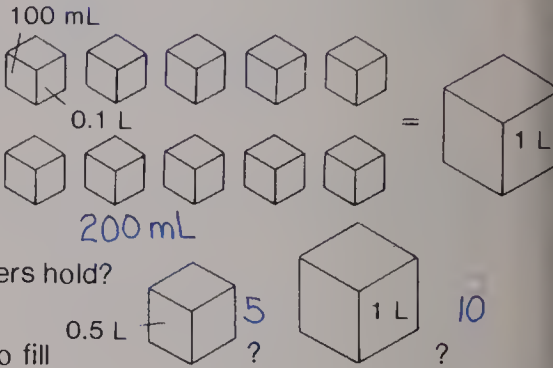
- Find a container that holds about one half a litre.

one litre = one thousand millilitres  
1 L = 1000 mL

How many millilitres in one half litre?  
Label this container 500 mL on one side  
and 0.5 L on another side.



- Find a container such that 10 of them fills one litre. Each is one tenth of a litre.  
Label this 0.1 L.  
This container holds 100 mL.



- How many millilitres do 2 containers hold?
- How many of these are needed to fill

**Using the Book** Group the children and provide the materials. Give them the instructions or let them work from the text if they can handle the reading. Move about discussing what each group is doing. Ask questions to see if they are absorbing the concepts.  
"About how many litres in this container (holding up a large container)?"  
"How many of these small containers (0.5 L) in this one (1 L)?"  
★ "10 of these (100 mL) fills one of these (1 L). What fraction is this (100 mL) of this one (1 L)?"  
"How many drops in 10 mL?"

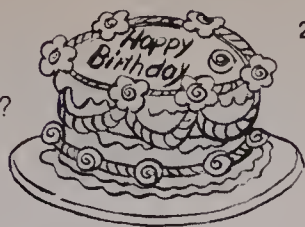
# Birthday Party

1. John's birthday.

9 friends are coming.

How many altogether?

10



2. John and his friends

like milk and cake.

Each drinks 2 glasses.

How many glasses altogether?

20

3. 1 L of milk is about 10 glasses.

2 L of milk are how many glasses?

20

4. 1 glass is 100 mL.

10 glasses are how many millilitres?

1000 mL



5. 2 L of milk are needed.

Should John buy the large carton

or 2 small cartons?

2 small cartons



50¢



\$1.10

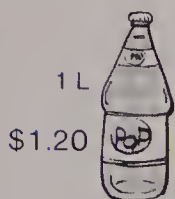
6. John and his father wanted

1 L of pop.

Do 2 small bottles hold the

same as 1 large bottle?

yes



0.5 L 0.5 L



70¢ 70¢

7. Which is the better buy, the large bottle or 2 small bottles?

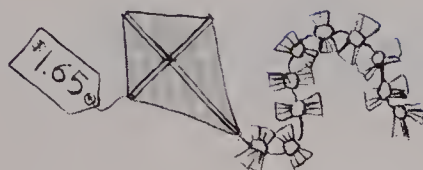
large bottle

8. John's father bought a kite for John.

He gave the clerk a two-dollar bill.

How much change?

35¢



Ratio, capacity problems 139

## OBJECTIVE

To solve problems related to capacity and money

## PACING

Level A 1-6

Level B 1-7

Level C All

## VOCABULARY

clerk

## ACTIVITIES

1. Set up (or rearrange) a store in the classroom (see page 92) and price items to reflect the ideas suggested on this problem page; for instance, price some goods so 2 small articles cost more (and some less) than 1 large size (same quantity).

(a) Direct children to buy items for a meal (dinner?) for the family (4 altogether?) given a fixed amount of money (\$5.00?).

(b) Direct children to buy items that have a fixed mass, capacity, or length (4 kg, 5 L, 5 m). Each child is to record the purchases.

(c) Make up a menu and a shopping list to go with it. Find the cost of items on the shopping list.

2. Children may draw a picture of an activity they like to do at a party.

3. Plan a birthday for a small group of children. Determine how much of each item will be needed and how much the items will cost.

### Using the Book Emphasize the 4 steps:

What information do we have?

What is the question?

What operation: add, subtract, or count?

Write a number sentence.

In exploring the operation, discuss what aspect in the question tells us what to do; for instance: Are we considering some things together?; Are we counting?; Are we taking something away?; Is there more than one thing to do?; Are we comparing something?; etc.

In Exercise 2, information from Exercise 1 is necessary. There are 10 people altogether.

Exercise 5 should be emphasized. This is a very practical type question. Some children may say the 1 L carton is better because it is easier to handle and "little brother will not spill it." It may be necessary to ask, "Which way can you get 2 L of milk for the least amount of money?"

Exercises 6 and 7 will reinforce the concept of Exercise 5.



## OBJECTIVES

- To guess which is the lighter of two objects
- To guess the mass of an object in grams
- To use a scale to find the mass of an object to the nearest ten grams

## PACING

- Level A All
- Level B All
- Level C All

## VOCABULARY

guessing, checking, lighter, mass, object, grams, scale

## MATERIALS

scale marked in kilograms or balance scale with a set of masses, the objects illustrated or a set of similar objects

## BACKGROUND

This deals with "lighter" and hence the opposite "heavier".

## ACTIVITIES

1. Use the store activity suggested on page 139 involving mass of objects purchased.
2. Ask a group of children to make a list of 5 to 10 different objects (each of which has a different mass) along with the masses. They then make a matching game for the other children to solve.

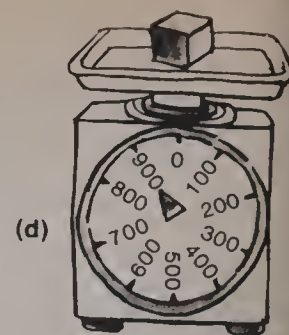
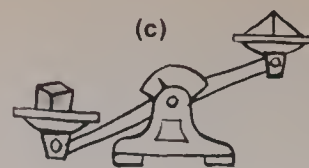
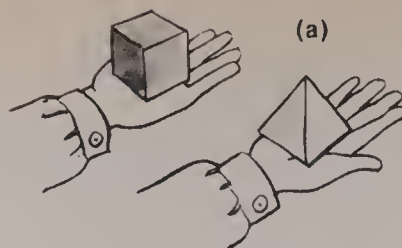
|          |        |
|----------|--------|
| Match.   |        |
| brick    | 0.5 kg |
| shoe     | 1 kg   |
| scissors | 200 g  |

•  
•  
•

## EXTRA PRACTICE

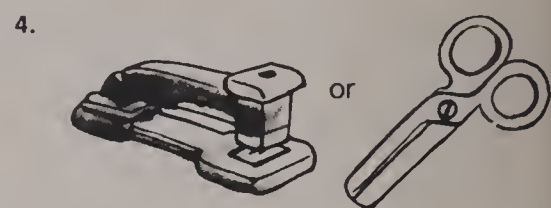
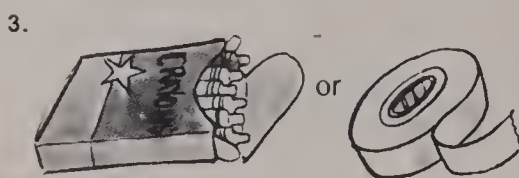
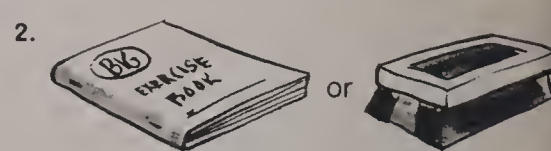
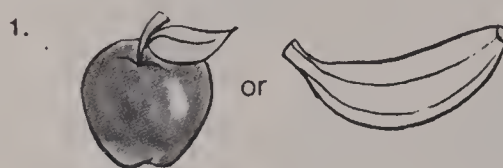
1.  $0.3 + 1.2$
2.  $0.6 + 0.7$
3.  $0.9 + 0.6$
4.  $1.3 + 0.6$
5.  $0.8 + 0.8$
6.  $0.9 - 0.4$
7.  $0.8 - 0.8$
8.  $1.6 - 0.4$
9.  $1.5 - 0.7$
10.  $1.8 - 0.9$

## Guessing and Checking



- (a) Guess which is lighter.
- (b) Guess the mass of the lighter one.
- (c) Check.
- (d) Place it on a scale to check its mass.

Which object in each of these pairs is lighter?  
Guess the mass of the lighter one in grams.  
Measure its mass on a scale.



140 Reviewing mass, concept of lighter

**Using the Book** The children, taking each pair of objects in turn, are to guess, record, then check by placing the two objects on opposite sides of a balance. When a child says, "The apple is lighter than the banana," ask the child, "Which is heavier?" The two words lighter and heavier should go together.

Practice in finding mass can be provided by asking the children to estimate the mass of each object. Then check by placing it on a scale. This may involve rounding the measurement to the nearest kilogram.



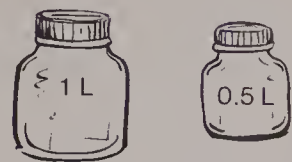
# Fruit Farmer



A fruit farm is called an orchard.

1. The owner, Mr. Wong, got 42 baskets of apples from one tree.  
He got 48 baskets from another tree.  
How many baskets altogether? **90**

2. Mr. Wong made apple cider.  
He filled these jars.  
How much cider did he make? **1.5 L**



3. Mr. Wong divided his field as shown.  
What part of his field is planted for apples?  **$\frac{1}{4}$**

|        |          |
|--------|----------|
| Apples | Cherries |
| Pears  | Peaches  |

4. Mr. Wong measured two apples.  
One was 0.5 dm.  
The other was 0.4 dm.  
How big were they together? **0.9 dm**

5. How much larger was the first apple than the second? **0.1 dm**

6. Mr. Wong planted  
10 apple trees in a row.  
One tree died.  
What fraction of the trees died?  **$\frac{1}{10}$**



## OBJECTIVE

To solve word problems

## PACING

Level A 1-5  
Level B All  
Level C All

## VOCABULARY

orchard, owner, cider, divided

## BACKGROUND

See Chapter Overview.

## ACTIVITIES

1. Have the class prepare a bulletin board display for The Fruit Farmer. Ask each child to write a word problem. These problems can then be done as review or practice in problem solving.
2. Have the children prepare a list of fruits that a Canadian fruit farmer might grow.
3. Discuss with the class all the people who depend on fruit farmers; for instance, cannery employees, truckers, store keepers, etc.

**Using the Book** Discuss the work on a fruit farm: pruning trees, irrigating, picking fruit, cultivating, spraying for insects, planting, and selling. Discuss losses also — such as from frost, insects, and so on.

Where necessary provide assistance in reading the problems.  
Review the steps in problem solving. See page 139.

## OBJECTIVES

To solve problems

To identify information in a problem  
which is not necessary for solving  
the problem

## PACING

Level A All

Level B All

Level C All

## VOCABULARY

information, length, envelope, tractor

## EXTRA PRACTICE

1. Black shoelace is 44 cm long.  
Brown shoelace is 28 cm long.  
Red shoelace is 14 cm long.  
How much longer is the black  
shoelace than the brown one?
2. There are 17 roses on our bush.  
A yellow rose is 12 cm across.  
A red rose is 9 cm across.  
How much bigger is a yellow rose  
than a red rose?

## What Don't You Need?

Sometimes you can have more information than you need to answer a question.

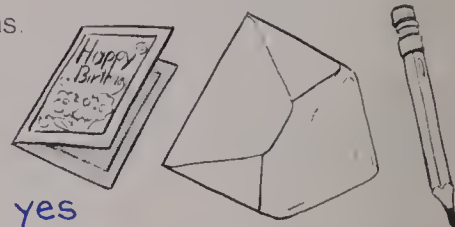
Solve: Length of red ribbon is 8 cm. 8 cm  
Length of blue ribbon is 21 cm. + 21 cm  
The box is 20 cm long 

---

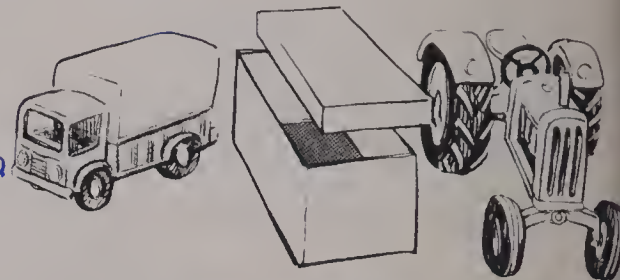
  
What is the total length of ribbon? 29 cm  
  
The ribbon is 29 cm long.

Copy the extra information. Solve the problems.

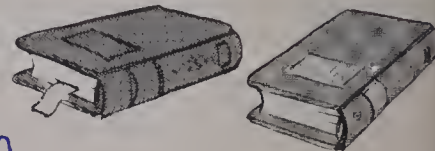
1. Envelope is 0.8 dm wide.  
Pencil is 0.9 dm long. ← Extra  
Birthday card is 0.7 dm wide.  
Will the birthday card fit in the envelope? yes



2. Toy truck is 0.6 m long.  
The box is 0.8 m long.  
The tractor is 0.9 m long. ← Extra  
Will the truck fit in the box? yes



3. Red book is 4.2 cm thick.  
Black book is 3.9 cm thick.  
Red book is 16 cm long. ← Extra  
How thick are the two books together? 8.1 cm



142 Problem solving: extraneous information

**Using the Book** Point out to the class that in some problems more information is provided than is necessary. Therefore, they must decide what information is necessary and what is extra — what they don't need to answer the question. After discussing the example, assign the page. Then move about the classroom giving help to individual children. If reading is a problem with some children, you may decide to have a reading lesson at this time.

**Alternate Approach:** Discuss each question in class by having a child (a) read aloud a question, (b) use the steps in problem solving, (c) decide what is needed and what is not needed, and (d) solve the problem at the chalkboard. Individual children may do various steps.

# Tune Up

Add

- |   |  |   |   |  |
|---|--|---|---|--|
| 1. $\begin{array}{r} 23 \\ + 14 \\ \hline 37 \end{array}$     | 2. $\begin{array}{r} 42 \\ + 37 \\ \hline 79 \end{array}$      | 3. $\begin{array}{r} 29 \\ + 17 \\ \hline 46 \end{array}$     | 4. $\begin{array}{r} 54 \\ + 39 \\ \hline 93 \end{array}$     | 5. $\begin{array}{r} 68 \\ + 79 \\ \hline 147 \end{array}$     |
| 6. $\begin{array}{r} 314 \\ + 123 \\ \hline 437 \end{array}$  | 7. $\begin{array}{r} 326 \\ + 143 \\ \hline 469 \end{array}$   | 8. $\begin{array}{r} 562 \\ + 204 \\ \hline 766 \end{array}$  | 9. $\begin{array}{r} 371 \\ + 228 \\ \hline 599 \end{array}$  | 10. $\begin{array}{r} 414 \\ + 344 \\ \hline 758 \end{array}$  |
| 11. $\begin{array}{r} 345 \\ + 126 \\ \hline 471 \end{array}$ | 12. $\begin{array}{r} 876 \\ + 343 \\ \hline 1219 \end{array}$ | 13. $\begin{array}{r} 694 \\ + 88 \\ \hline 782 \end{array}$  | 14. $\begin{array}{r} 345 \\ + 455 \\ \hline 800 \end{array}$ | 15. $\begin{array}{r} 800 \\ + 919 \\ \hline 1719 \end{array}$ |
| 16. $\begin{array}{r} 375 \\ + 243 \\ \hline 618 \end{array}$ | 17. $\begin{array}{r} 198 \\ + 234 \\ \hline 432 \end{array}$  | 18. $\begin{array}{r} 208 \\ + 419 \\ \hline 627 \end{array}$ | 19. $\begin{array}{r} 477 \\ + 185 \\ \hline 662 \end{array}$ | 20. $\begin{array}{r} 791 \\ + 109 \\ \hline 900 \end{array}$  |

Subtract

- |   |   |  |   |   |
|---|---|--|---|---|
| 21. $\begin{array}{r} 29 \\ - 16 \\ \hline 13 \end{array}$    | 22. $\begin{array}{r} 66 \\ - 30 \\ \hline 36 \end{array}$    | 23. $\begin{array}{r} 32 \\ - 16 \\ \hline 16 \end{array}$   | 24. $\begin{array}{r} 90 \\ - 36 \\ \hline 54 \end{array}$    | 25. $\begin{array}{r} 161 \\ - 98 \\ \hline 63 \end{array}$   |
| 26. $\begin{array}{r} 246 \\ - 112 \\ \hline 134 \end{array}$ | 27. $\begin{array}{r} 738 \\ - 38 \\ \hline 700 \end{array}$  | 28. $\begin{array}{r} 688 \\ - 436 \\ \hline 252 \end{array}$  | 29. $\begin{array}{r} 546 \\ - 302 \\ \hline 244 \end{array}$ | 30. $\begin{array}{r} 889 \\ - 256 \\ \hline 633 \end{array}$ |
| 31. $\begin{array}{r} 463 \\ - 116 \\ \hline 347 \end{array}$ | 32. $\begin{array}{r} 725 \\ - 281 \\ \hline 444 \end{array}$ | <p>Who am I?</p> <p>(a) I am a number 1 less than 1000. <b>999</b></p> <p>(b) I am a number 10 less than 1000. <b>990</b></p> <p>(c) I am a number 100 less than 1000. <b>900</b></p> <p>(d) I am a number 1000 less than 1000. <b>0</b></p> |   |   |
| 33. $\begin{array}{r} 780 \\ - 493 \\ \hline 287 \end{array}$ | 34. $\begin{array}{r} 700 \\ - 129 \\ \hline 571 \end{array}$ |  |   |   |

## OBJECTIVE

To maintain skills in addition and subtraction

## PACING

Level A 1-15, 21-30  
Level B 6-20, 26-34  
Level C Optional

Tune Up 143

**Using the Book** This page may be used to diagnose difficulties the children may have. On the basis of their difficulties, you may wish to provide additional help or remedial work.

| Item  | Page Reference |
|-------|----------------|
| 1-2   | 39, 40         |
| 3-5   | 47             |
| 6-10  | 44             |
| 11-20 | 52, 53         |
| 21-23 | 58             |
| 24-25 | 62, 63         |
| 26    | 65, 66         |
| 27-34 | 70, 71         |

For a more general review of all types of addition you may reassign page 54. For a more general review of all types of subtraction you may reassign page 68. It is suggested you reassign small parts of these pages so as not to bore the children and then only as required.



## OBJECTIVES

To write values greater than one dollar using standard dollar and cent form

To identify the number of dollars, dimes, and pennies in an amount written in standard form

## PACING

Level A 1-4

Level B 3-9

Level C 3-9

## VOCABULARY

dollars, dimes, pennies, amount

## MATERIALS

play money, real money

Discarded lottery tickets showing different denominations are a good source for authentic-looking paper money. Have the children bring in any unwanted used tickets.

## SUGGESTIONS

**Initial Activity** Review the coins and dollar bill. Ask how many pennies in a dollar, how many dimes in a dollar, how many nickles in a dime, etc.

## ACTIVITIES

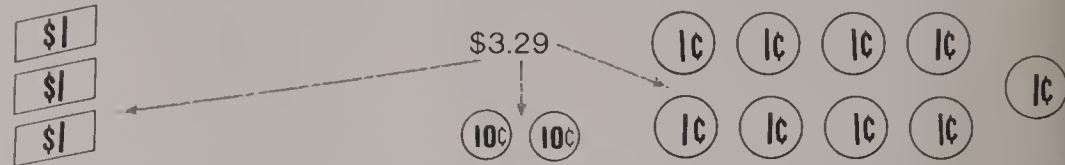
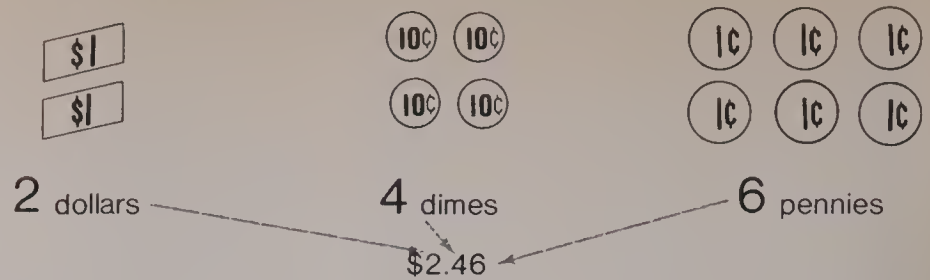
1. Provide each group with a small piece of paper on which is printed an amount of money, e.g., \$2.36. Each group is then to set out the amount of money indicated: 2 dollars, 3 dimes, and 6 pennies. The pieces of paper are moved from one group to another.

2. Put a number of coins and dollar bills (play money) in a box. Children take turns using a large spoon to scoop up as much money as possible (one hand only!). The winner is the one with the most money on the spoon. Return the money after each try. Write the amount in dollars.

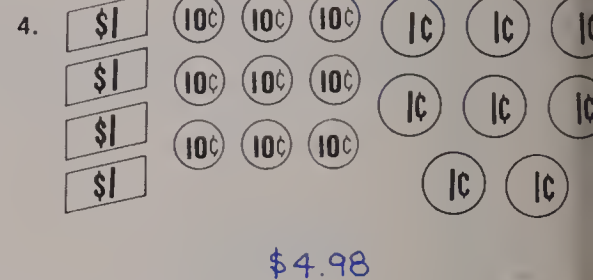
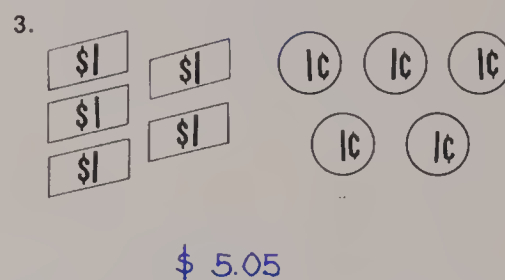
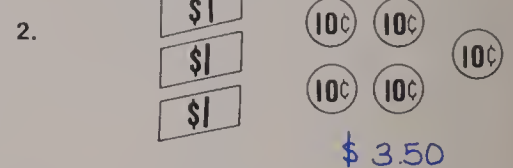
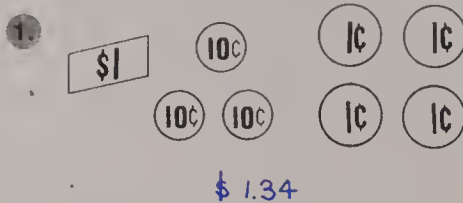
3. Prepare this Tic Tac Toe board. The players must select the correct bills and coins (from a box) for the squares they wish to place a marker on.

|        |        |        |
|--------|--------|--------|
| \$1.32 | \$1.56 | \$0.30 |
| \$2.05 | \$4.05 | \$2.00 |
| \$3.50 | \$2.25 | \$1.75 |

## Dollars, Dimes, and Pennies



Write the amount.



How many dollar bills, dimes, and pennies? Draw a picture to show.

5. \$1.13

6. \$2.47

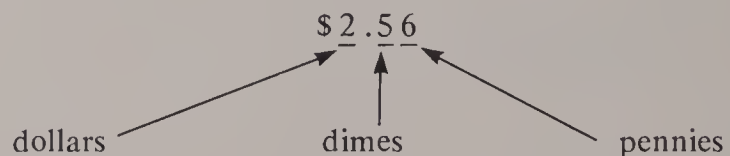
7. \$4.76

8. \$5.98

9. \$3.63

144 Place value with money

**Using the Book** Referring to the display, guide the children to realize that the position tells the number of dollars, dimes, and pennies.



Assign the exercises. Be certain children are clear on how and where to record answers.

**Answers:**

5. 1 dollar, 1 dime, 3 pennies

6. 2 dollars, 4 dimes, 7 pennies

7. 4 dollars, 7 dimes, 6 pennies

8. 5 dollars, 9 dimes, 8 pennies

9. 3 dollars, 6 dimes, 3 pennies

# Adding Dollars and Cents



\$1.25



\$2.30

$$\begin{array}{r} \$1.25 \longrightarrow 125\text{¢} \\ + \$2.30 \longrightarrow + 230\text{¢} \\ \hline \$3.55 \longrightarrow 355\text{¢} \end{array}$$

Compare

How much for these Guide items?

Adding money is like adding whole numbers.

|  |  |  |  |
|--|--|--|--|
| $\begin{array}{r} \$1.15 \\ + 1.24 \\ \hline \$2.39 \end{array}$ | $\begin{array}{r} \$4.34 \\ + 2.15 \\ \hline \$6.49 \end{array}$ | $\begin{array}{r} \$2.53 \\ + 1.32 \\ \hline \$3.85 \end{array}$ | $\begin{array}{r} \$0.21 \\ + 4.56 \\ \hline \$4.77 \end{array}$ |
|--|--|--|--|

● Bicycle lamp cost \$4.15.  
Batteries cost \$1.84.  
How much in all? **\$5.99**

Solution

$$\begin{array}{r} \$4.15 \\ + 1.84 \\ \hline \$5.99 \end{array}$$

|  |  |   |   |
|--|--|---|---|
| $\begin{array}{r} 6. \quad \$1.17 \\ + 1.12 \\ \hline \$2.29 \end{array}$  | $\begin{array}{r} 7. \quad \$2.32 \\ + 1.65 \\ \hline \$3.97 \end{array}$  | $\begin{array}{r} 8. \quad \$4.57 \\ + 3.21 \\ \hline \$7.78 \end{array}$   | $\begin{array}{r} 9. \quad \$7.22 \\ + 1.66 \\ \hline \$8.88 \end{array}$           |
| $\begin{array}{r} 10. \quad \$1.46 \\ + 1.53 \\ \hline \$2.99 \end{array}$ | $\begin{array}{r} 11. \quad \$3.01 \\ + 0.95 \\ \hline \$3.96 \end{array}$ | $\begin{array}{r} 12. \quad \$9.01 \\ + 1.10 \\ \hline \$10.11 \end{array}$ | $\begin{array}{r} \star 13. \quad \$14.00 \\ + 38.75 \\ \hline \$52.75 \end{array}$ |

14. Mark bought a compass for \$2.30. He bought a whistle for \$1.25. How much in all? **\$3.55**

15. Rivka bought a puzzle for \$1.25. She bought a belt for \$3.74. How much altogether? **\$4.99**

Addition with money 145

**Using the Book** Direct the children's attention to the display at the top of the page. Point out that this is the same procedure as demonstrated in the lesson's Initial Activity. Be sure to emphasize the comparison between \$3.55 and 355¢ to show that adding decimals is as easy as adding whole numbers. Discuss how adding money is different than adding whole numbers. (You must line up the decimal and put a decimal in the sum.)

## OBJECTIVE

To add quantities of money

## PACING

Level A 1-12, 14, 15

Level B 1-12, 14, 15

Level C All

## VOCABULARY

compass, puzzle

## MATERIALS

objects of different values such as a box of crayons, pair of sunglasses, etc.; bills and coins

## RELATED AIDS

HMS—DM42.

## SUGGESTIONS

**Initial Activity** You might begin by showing the box of crayons priced at \$1.25 and the sunglasses priced at \$2.55. Ask a child to put out the money necessary to buy the crayons. Then ask a child to put out the money for the sunglasses. Ask a third to count the total amount of money added. Then show the class how we might do this another way.

Write:

$$\begin{array}{r} \$1.25 \\ 2.55 \\ \hline \$3.80 \end{array}$$

And since

$$\begin{array}{r} \$1.25 \longrightarrow 125\text{¢} \\ \$2.55 \longrightarrow 255\text{¢} \\ \hline 380\text{¢} \end{array}$$

we see that adding money is like adding whole numbers.

## ACTIVITIES

1. Put out sets of two objects that are priced. Ask the children to calculate how much for each pair of items.

2. Use the play store (see page 139). Ask each child to choose two items. Calculate the cost of the two items. Then the child should write the amount in a workbook and add.

3. Practise mental calculations. Call out two coins (later three), i.e., 1 dime and 3 pennies. The first child to raise a hand and give the correct value gets a point. The child with the most points at the end of the game is the winner.

## EXTRA PRACTICE

- ★1. Mickey bought a rucksack for \$7.10. She bought hiking boots for \$29.65. How much in all did she pay?
- ★2. Rob bought a camp stove for \$22.50. He bought a pot set for \$8.67. How much did he spend in all?



## OBJECTIVE

To subtract dollars and cents

## PACING

Level A 1-12, 14, 15  
Level B 1-12, 14, 15  
Level C 4-15

## VOCABULARY

purse

## MATERIALS

objects and money as for page 145

## RELATED AIDS

HMS—DM42.

## SUGGESTIONS

**Initial Activity** Set out an amount of money (\$3.55) that "John has in his pocket". He then buys the crayons which are priced at \$1.25. "How much money does he have left?" A child can take \$1.25 out of the money. Then the child can count the amount left. Then show the child how we might do this another way.

$\$3.55 \rightarrow 355\text{¢}$   
 $-\$1.25 \rightarrow 125\text{¢}$   
 $\$2.30 \rightarrow 230\text{¢}$

This is like subtracting whole numbers.

## ACTIVITIES

1. Make up assignment cards and give one to each group of children. Provide old catalogues.  
Assignment Cards

Copy and complete this card.

I have \$3.75.

I bought

Glue  
picture  
here.

for \$\_\_\_\_\_.

\$3.75

—

I have \$\_\_\_\_\_ left.

2. Use the play store.

Tell the children how much money each of them has. Each child is to buy an item at the store and calculate how much money is left.

★3. Practise mental calculations.

Call out two coins, i.e., 1 dime and 2 pennies, 2 dimes and 5 pennies. The first child to raise a hand and give the correct difference gets a point. The child with the most points at the end of the game is the winner.

## Subtracting Dollars and Cents

Millie had \$4.65.  
She paid \$2.11 for a  
Girl Guide Camp Book.  
How much does she have left?

$\$4.65 \rightarrow 465\text{¢}$   
 $-\$2.11 \rightarrow -211\text{¢}$   
 $\$2.54 \rightarrow 254\text{¢}$   
Compare

Subtracting money is like subtracting whole numbers.

1.  $\begin{array}{r} \$2.76 \\ - 1.43 \\ \hline \$1.33 \end{array}$

2.  $\begin{array}{r} \$5.39 \\ - 3.17 \\ \hline \$2.22 \end{array}$

3.  $\begin{array}{r} \$9.68 \\ - 5.47 \\ \hline \$4.21 \end{array}$

4.  $\begin{array}{r} \$6.86 \\ - 4.55 \\ \hline \$2.31 \end{array}$

5. Mark had \$5.63.  
He spent \$1.32.  
How much money is left?  $\$4.31$

$\begin{array}{r} \$5.63 \\ - 1.32 \\ \hline \$4.31 \end{array}$

6.  $\begin{array}{r} \$4.59 \\ - 1.47 \\ \hline \$3.12 \end{array}$

7.  $\begin{array}{r} \$5.39 \\ - 2.29 \\ \hline \$3.10 \end{array}$

8.  $\begin{array}{r} \$4.69 \\ - 1.69 \\ \hline \$3.00 \end{array}$

9.  $\begin{array}{r} \$7.11 \\ - 4.00 \\ \hline \$3.11 \end{array}$

10.  $\begin{array}{r} \$6.88 \\ - 4.25 \\ \hline \$2.63 \end{array}$

11.  $\begin{array}{r} \$18.89 \\ - 5.49 \\ \hline \$13.40 \end{array}$

12.  $\begin{array}{r} \$12.99 \\ - 4.88 \\ \hline \$8.11 \end{array}$

★ 13.  $\begin{array}{r} \$42.99 \\ - 18.99 \\ \hline \$24.00 \end{array}$

14. Tom had \$8.59 in the bank.  
He took out \$2.15.  
How much is left in the bank?  $\$6.44$

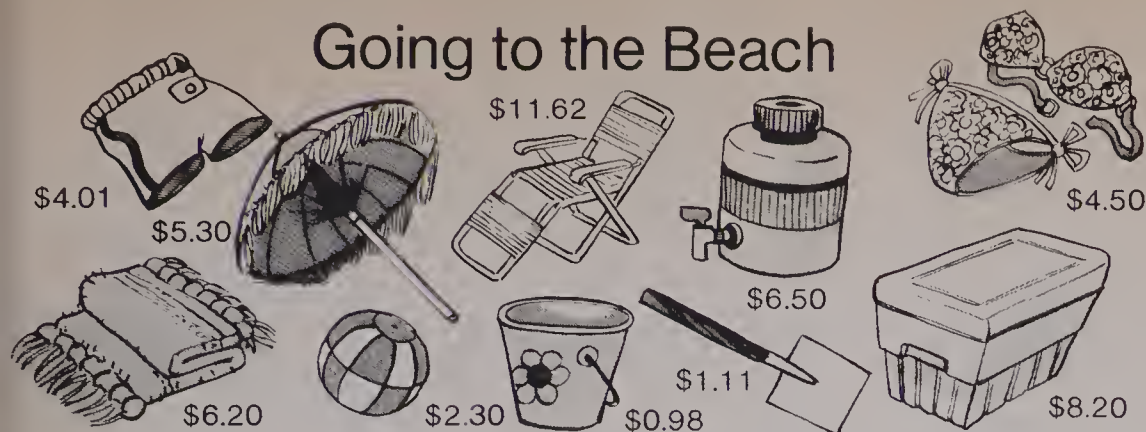
15. Mary Lynne had \$2.65 in her purse.  
She spent \$0.44.  
How much is left in her purse?  $\$2.21$

146 Subtraction with money

**Using the Book** Have the display information read. Discuss how subtracting money is like subtracting whole numbers and how it is different. (You must line up the decimals and you must put a decimal in the sum.)



## Going to the Beach



## OBJECTIVE

To add and subtract money in word problems where the information is in a picture chart

## PACING

Level A 1-8  
Level B 1-8  
Level C 2-10

## VOCABULARY

planned, vacation, trunks, umbrella, thermos jug, lounge chair

## MATERIALS

play store and items to go with it

## ACTIVITIES

- You might use the play store in your classroom (see page 139).
  - Each child is asked to choose two items and add to find how much they cost.
  - Each child is given a certain amount of money. The child can choose an object and determine how much money would be left.
  - A storekeeper can tell each child whether the customer has enough money for the item(s).

2. Provide old catalogues.

- Children can cut out two pictures of items they would like to buy. They must calculate the amount of money they would need to buy the two items.
- Give each child a certain amount of money. Have them cut out pictures of two items they could buy.
- Use the assignment cards from page 146.

Problems 147

Mike and Gloria planned a vacation to the beach.

- Mike bought: trunks.  
a pail.  
Total cost? **\$ 4.99**
- Gloria bought: a swimming suit.  
a beach umbrella.  
Total cost? **\$ 9.80**
- Father bought: an ice chest.  
a thermos jug.  
Total cost? **\$ 14.70**
- Mother bought: a lounge chair.  
a towel.  
Total cost? **\$ 17.82**
- Gloria had \$1.20.  
She wanted a ball.  
How much more does she need? **\$ 1.10**
- Mike had \$0.63.  
He wanted a pail.  
How much more does he need? **\$ 0.35**
- How much more is the ice chest than the towel? **\$ 2.00**
- How much more is the chair than the umbrella? **\$ 6.32**
- ★ Father bought a bathing suit, trunks, and umbrella.  
How much did he pay? **\$ 13.81**
- ★ 10. What is the cost of a towel, a shovel, and a ball? **\$ 9.61**

**Using the Book** Discuss the display to be certain the children can interpret the information there. Develop such questions as:

“What is the cost of the \_\_\_\_\_?”

“How would you find the cost of \_\_\_\_\_ and \_\_\_\_\_?”

“You have \$10.00. Then you buy a towel. How would you calculate how much money you’d have left?”

“You have \$1.20. You want to buy a thermos jug. How much more do you need?”

Review the situation in each problem by playacting to help children decide whether to add or subtract. Then ask for the key words that help the children to know which operation is needed.

Review the steps in problem solving.

## OBJECTIVES

- To recognize common bills and coins
- To calculate the value of a set of bills and coins
- To select a set of bills and coins worth a given amount

## PACING

- Level A 1-15, 19, 20, 23-26
- Level B 4-20, 23-26
- Level C 4-26

## MATERIALS

the bills and coins shown in the display — play money, real ones should be available for display

## RELATED AIDS

HMS—DM43.

## SUGGESTIONS

**Initial Activity** Review counting by 5's, 10's, 25's, and 50's starting at various places.

## ACTIVITIES

1. Collect and mount on cardboard advertisements from newspapers for such items as:

|            |     |
|------------|-----|
| Kleenex    | 29¢ |
| toothpaste | 57¢ |
| comb       | 38¢ |
| 3 pens     | 49¢ |

Distribute a card to each group.

Have child make and complete this chart in different ways.

| Had    | Bought      | Bought   | Total Cost | Change |
|--------|-------------|----------|------------|--------|
| \$1.00 | Kleenex 58¢ | comb 38¢ | 96¢        | 4¢     |

Change this to suit ability of group.

2. Have children practise counting money. Children can work in pairs.

One hands a selection of bills and coins to the second who must count the money. After ten turns each, the player with the most correct answers is the winner.

3. Children working in pairs take turns with one naming a sum of money and the other selecting from the money at hand, bills and coins that have the value called. After ten turns each, the player with the most correct answers is the winner.

4. Form teams to play this game. Hold up an object and state its price, i.e., a glove — \$4.55. Each team chooses from a box the bills and coins to make the exact amount of money stated. The team using the least number of bills and coins gets one point. The team with the most points after ten objects is the winner.

## More Money

\$10

\$5

\$2

\$1

ten dollars \$10.00 five dollars \$5.00 two dollars \$2.00 one dollar \$1.00

50¢

25¢

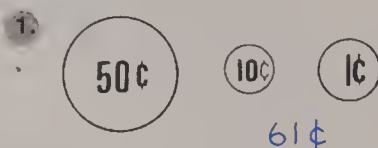
10¢

5¢

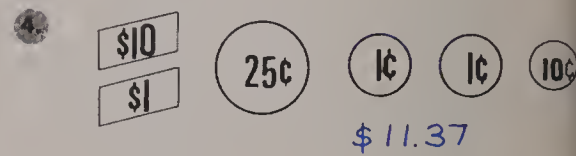
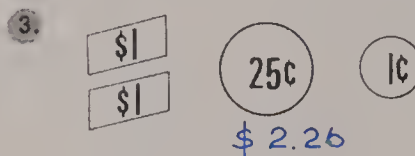
1¢

half dollar \$0.50 50¢ quarter \$0.25 25¢ dime \$0.10 10¢ nickel \$0.05 5¢ penny \$0.01 1¢

How many cents?



How many dollars and cents?



What bills and coins?

5. 45¢ 25¢, 10¢, 10¢ 6. \$1.15 \$1.00, 10¢, 5¢ 7. \$5.26 \$5.00, 25¢, 1¢ 8. \$2.36 \$2.00, 25¢, 10¢, 1¢

148 Money

**Using the Book** Show the class real bills and coins. Hold up the \$10 bill and ask how many:

- (a) \$1 bills to make one \$10 bill?
- (b) \$2 bills to make one \$10 bill?
- (c) \$5 bills to make one \$10 bill?

Repeat with:

- (a) \$1 bill and the various coins.
- (b) \$2 bill and the various coins.
- (c) \$5 bill and the various coins and bills.

Practise adding money orally. Ask the children how much you have when you have (hold up):

- a half dollar and a quarter;
- a quarter, a dime, and a nickel;
- to such as:
- a \$5 bill, a \$1 bill, a half dollar, and a dime.

Then name for the children a sum (i.e., \$3.25) and ask them to select bills and coins that would have this value. Ask if there is more than one way to do this. Eventually many children should be able to do this with pencil and paper without the play money.

In this set of exercises, any correct answer is acceptable. You may challenge your better pupils to list the least number of bills and coins for each question.

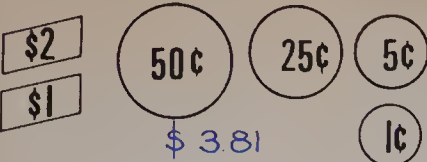
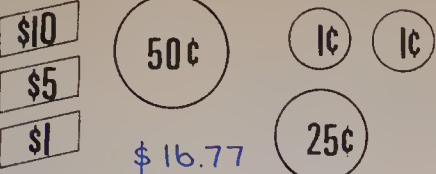

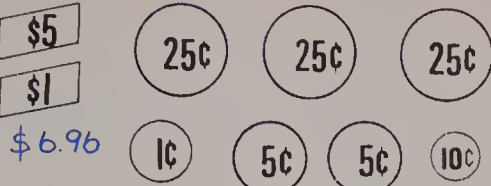
## EXTRA PRACTICE

1. Copy and complete.

- (a) 15, 20, 25, \_\_, \_\_, \_\_, \_\_, \_\_
- (b) 65, 70, 75, \_\_, \_\_, \_\_, \_\_, \_\_
- (c) 40, 50, 60, \_\_, \_\_, \_\_, \_\_, \_\_
- (d) 25, 50, \_\_, \_\_
- (e) 50, 100, \_\_, \_\_

2. Mark bought a pen for \$6.89. He gave the clerk the exact bills and coins. What bills and coins did he use?
3. Sylvia bought a calculator. She gave the clerk the exact change. What bills and coins did she use? What information is missing?

How many dollars and cents?

9.  \$3.81
10.  \$16.77
11.  \$7.46
12.  \$6.96

What bills and coins? Give two answers for each.

13. \$0.55      14. \$3.36      15. \$6.85  
16. \$11.30      17. \$16.45      18. \$7.30

Solve.

19. Sammy bought a swimming suit. Cost: \$4.13. \$2.00, \$2.00, 10¢, What bills and coins? 1¢, 1¢, 1¢
20. Mark has \$7.55. \$5.00, \$2.00, What bills and coins? 50¢, 5¢
21. Evelyn has \$17.39. \$10.00, \$5.00, What bills and coins? \$2.00, 25¢, 10¢, 1¢, 1¢, 1¢, 1¢
22. Georgina bought a beach ball. \$5.00, 10¢, She gave the clerk exactly \$5.23. 10¢, 1¢, What bills and coins did she use? 1¢, 1¢

Unscramble these names of coins.

23. rugaret quarter  
24. kiceln nickel  
25. mide dime  
26. nepny penny

### BRAINTICKLER

Mr. and Mrs. Smith have six daughters.  
Each daughter has a brother.  
How many people are in the Smith family? 9

### Answers:

1. 50¢, 5¢ or 25¢, 25¢, 5¢  
2. \$2.00, \$1.00, 25¢, 10¢, 1¢ or \$1.00, \$1.00, \$1.00, 25¢, 10¢, 1¢  
3. \$5.00, \$1.00, 50¢, 25¢, 10¢ or \$5.00, \$1.00, 25¢, 25¢, 25¢, 10¢  
4. \$10.00, \$1.00, 25¢, 5¢ or \$10.00, \$1.00, 10¢, 10¢, 10¢  
5. \$10.00, \$5.00, \$1.00, 25¢, 10¢, 10¢ or \$10.00, \$5.00, \$1.00, 25¢, 10¢, 5¢, 5¢  
6. \$5.00, \$2.00, 25¢, 5¢ or \$5.00, \$2.00, 10¢, 10¢, 10¢



## OBJECTIVES

To use mathematics in problems of environmental control  
To practise adding and subtracting money in word problems

## PACING

Level A 1-5  
Level B 1-5  
Level C All

## VOCABULARY

recycling, wastepaper, battery

## SUGGESTIONS

**Initial Activity** Discuss the need for conservation. Ask if any of the class collect bottles or newspapers either independently or as a part of a Cub or Brownie group. Discuss.

## ACTIVITIES

Ask children to do this puzzle.  
(Answers are given.) (Reserve this activity to be used with page 151.)  
How many cents?

|   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|
| a | b |   |   | c | d | e |
| 1 | 6 | 5 |   | 2 | 3 | 3 |
| f |   |   | g |   | h |   |
| 2 | 0 |   | 9 |   | 4 | 7 |
|   |   | i |   | j |   |   |
| 7 |   | 1 | 6 | 2 |   | 5 |
|   | k |   |   | l | m |   |
|   | 9 | 5 |   | 7 | 5 |   |
| n |   |   |   | o |   |   |
| 2 | 9 | 0 |   | 5 | 0 | 0 |

### ACROSS

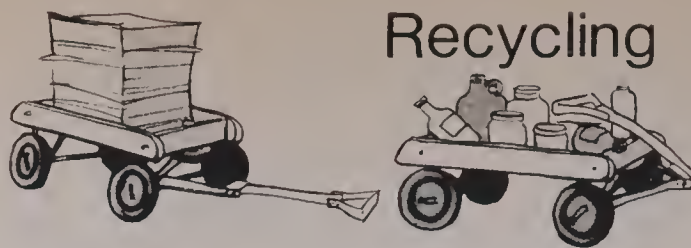
- a 1 dollar, 1 half dollar, 3 nickels  
c 2 dollars, 1 quarter, 8 pennies  
f 2 dimes  
h 3 pennies less than a half dollar  
i 1 dollar, 2 quarters, 12 pennies  
k a nickel less than a dollar  
l a quarter less than 1 dollar  
n 3 dollars less a dime  
o 5 dollars

150 Money, word problems

### DOWN

- a 2 pennies more than 1 dollar and 1 quarter  
b 1 dime and 1 half dollar  
d 1 quarter and 9 pennies  
e 3 dollars and 3 quarters  
g 4 pennies less than a dollar  
i 3 half dollars  
j 2 dollars and 3 quarters  
k one penny less than a dollar  
m 5 dimes

## Recycling



Recycle  
Your Bottles,  
Newspapers, . . .

1. Lucille returned two boxes of wastepaper.  
One box sold for \$1.35.  
The other sold for \$2.14.  
How much altogether? **\$3.49**

2. Roger sold bottles and cans.  
One large bottle for a quarter.  
One small bottle for a dime.  
One can for a nickel.  
How much altogether? **\$0.40**

3. Margie collected one old car battery.  
She needed \$3.75 for a doll.  
How much more money does she need? **\$1.25**

4. Harry needed \$8.55 for a game.  
He sold old newspapers worth \$4.35.  
How much more money does he need? **\$4.20**

- ★ 6. Alma sold bottles worth \$2.65.  
She sold old newspapers worth \$3.12.  
She needs \$8.78 for a ball glove.  
How much more money does she need? **\$3.01**

### WE PAY MORE.

Paper: \$0.35 per bundle  
Bottles: large — \$0.25  
              small — \$0.10  
Pop cans: — \$0.05  
Car battery: — \$2.50

5. Henry sold bottles and cans.  
2 large bottles.  
4 cans. **\$0.70**  
How much altogether?

Add first.  
Then subtract.



**Using the Book** If necessary, read or have read the word problems on this page. Make certain that the readability presents no problem and that children know the response format.

Some of these problems require more than just adding or subtracting two numbers. Caution the children to be extra careful with Exercises 2 and 5.

## EXTRA PRACTICE

1. Pedro collected  
3 bundles of paper,  
2 small bottles,  
2 large bottles.  
How much money did he get altogether?
2. Henri collected  
2 car batteries,  
3 bundles of paper.  
How much money did he get altogether?
3. Janelle needs \$4.50 for a ball glove.  
How much would she have left if she sold two batteries and bought the glove?

# Counting Your Change

Cost of lunch kit: \$3.25.  
Marg gave the clerk \$5.00.  
Clerk gave Marg



Check:

Count: 325    350    375    400    500  
          25¢    25¢    25¢    100¢

Marg's change is correct.

To check change: Count from the sale to the amount paid.

Check the change. Is it correct?

- Bought the book.  
Gave clerk \$1.00.  
Change received: *correct*
- Bought toy car.  
Gave clerk \$5.00.  
Change received: *correct*
- Bought a doll.  
Gave clerk \$5.00.  
Change received: *change is 5¢ short*

Making change 151

## OBJECTIVE

To check change received by adding the change to the sale price

## PACING

Level A All  
Level B All  
Level C All

## VOCABULARY

bought, received

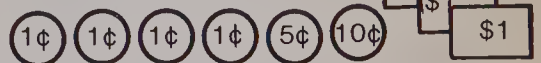
## SUGGESTIONS

**Initial Activity** Review again counting by 1's, 5's, 10's, and 25's starting at various places, each a multiple of the number the child will count by.

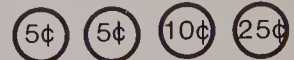
## ACTIVITIES

1. Make additional assignment cards each containing a problem of this type.

Bought a wading pool for \$7.31.  
Gave clerk \$10.00.  
Change received:



Bought a candy apple for \$0.55.  
Gave: \$1.00.  
Change received:



2. Use the Play Store from Activity 1 on page 147. Children should count the change in the method used on page 151.

**Using the Book** Encourage children to count the change from the cost price to the amount given the clerk. The reason for this method is to build towards this method of making change — the counting method that is developed on the next page. There will be children who will want to count the change and add this sum to the price of the article. While this is correct it does not introduce the method of making change on the next page. In order to ensure the method we want to develop is used, it is recommended this page be done orally working with small groups. Assign the Activity from page 150 to the groups you are not working with or some previous activity such as the Play Store (page 147) or Extra Practice (page 149).



## OBJECTIVE

To make change for one dollar using the "counting method"

## PACING

Level A 1-9  
Level B 1-9  
Level C 4-10

## ACTIVITIES

1. Set up "play-store" situations (described on page 139) where clerks have to make change for items purchased. Ask the "consumer" to check his change carefully.

2. Use Activity 1 on pages 148 and 149. Ask child to list the coins in the change column.

3. Ask the children to form teams and play this game. Hold up an object and state its price, i.e., a glove — \$4.55. Then say, "\$10 bill was given to the clerk." The teams then choose bills and coins to make the change. The team with the least number of bills and coins gets the point. The team with the most points after ten objects is the winner.

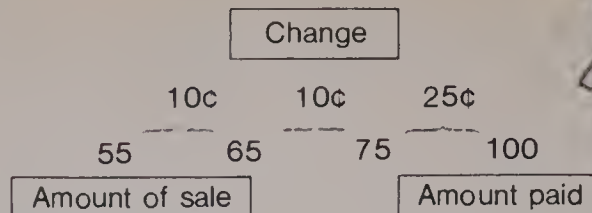
## EXTRA PRACTICE

What change?

- Matchbox truck: \$0.82.  
Gave: \$5.00
- Rubber ball: \$1.55  
Gave: \$5.00
- Game of jacks: \$4.35  
Gave: \$10.00
- Electronic game: \$6.65  
Gave: \$20.00

## Making Change

Bought a comic book.  
Paid \$1.00.  
Change?



The change is: 2 dimes and a quarter.

- Count to 100 by 5's starting at (a) 10 (b) 35 (c) 55 (d) 75.
- Count to 100 by 10's starting at (a) 10 (b) 30 (c) 70 (d) 80.
- Count to 100 by 25's starting at (a) 25 (b) 50 (c) 75.

What change?

4. Pop: 35¢  
Gave: 50¢  
Count: 35 45 50  
Coins: 10¢ 5¢

Hot dog: 60¢  
Gave: one-dollar bill  
Count: 60 65 70 75 100  
Coins: 5¢ 5¢ 5¢ 25¢

6. Whistle: 85¢  
Gave: one-dollar bill  
Count: 85 90 100  
Coins: 5¢ 10¢

7. Candy: 43¢  
Gave: one-dollar bill  
Count: 43 44 45 50 75 100  
Coins: 1¢ 1¢ 5¢ 25¢ 25¢

8. Badge: 49¢  
Gave: \$1.00 1¢, 25¢, 25¢

9. Kite: 69¢  
Gave: \$1.00 1¢, 5¢, 25¢

★ 10. Doll's dress: 71¢  
Gave: \$2.00 1¢, 1¢, 25¢, \$1.00

152 Making change

**Using the Book** Ask a child to look at the display, then say, "What is the price of a comic book?" "How much change would you get from a \$1.00 bill if you bought one?" Encourage children to make change from the cost price to the amount given the clerk in this order:

- count pennies until a 5 or 0 is reached in the pennies' column,
- count by 5's or 10's until 25, 50, 75, or 100 is reached,
- count by 25's until 100 is reached.

### Answers:

- (a) 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100  
(b) 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100  
(c) 55, 60, 65, 70, 75, 80, 85, 90, 95, 100  
(d) 75, 80, 85, 90, 95, 100

- (a) 10, 20, 30, 40, 50, 60, 70, 80, 90, 100  
(b) 30, 40, 50, 60, 70, 80, 90, 100  
(c) 70, 80, 90, 100  
(d) 80, 90, 100


- (a) 25, 50, 75, 100  
(b) 50, 75, 100 (c) 75, 100



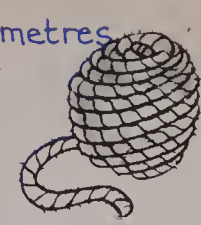
# At the Supermarket


Name the unit used to measure each.


1.  millilitres

2.  millilitres

3.  grams

4.  metres


5.  centimetres


6.  kilograms


7.  millilitres


8.  kilograms


Choose the correct unit.


9.  400 g  
400 kg or 400 g

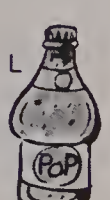


10.  60 cm  
60 cm or 60 m

11.  500 mL  
500 mL or 500 L

12.  4 kg  
4 g or 4 kg

13.  4 L  
4 L or 4 mL

14.  1.5 m  
1.5 cm or 1.5 m

15. Which is the better buy? 1 L bottle  
 \$1.35  
 0.5 L 70¢  
 0.5 L 70¢

Practice 153

**Using the Book** Either assign Exercises 1-8 and then correct them or do Exercises 1-8 orally. Then either assign Exercises 9-15 or do them orally. If possible, have suitable items present in the class so the children can experience each situation with real objects.

## OBJECTIVE

To review units of measure

## PACING

Level A All  
Level B All  
Level C All

## MATERIALS

items similar to those illustrated on this page

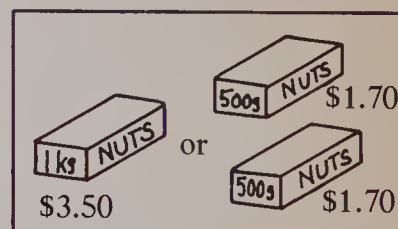
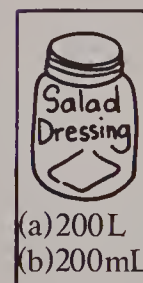
## SUGGESTIONS

**Initial Activity** If you feel it necessary, discuss with the class or a group, sample questions of each type: (a) have one item for each of litres, millilitres, grams, and kilograms (b) hold up one of the items, say a large box of chalk, and ask, "Is this about two kilograms or two grams?" This portion of the page is to determine whether or not the children are associating an item with the correct magnitude of mass or capacity.

## EXTRA PRACTICE

1. For more questions of type 1 to 8, provide pictures on cards of: box of potato chips, box of candies, carton of milk, bottle of ketchup, bottle of salad dressing, and so on.

2. Additional questions of types 9 to 15 can easily be prepared by the children. Number and put each question to be answered on a card to be passed among the groups.



## OBJECTIVE

To evaluate achievement of the chapter objectives

## PACING

Level A All  
Level B All  
Level C All

## RELATED AIDS

HMS—DM1 and DM44.

## Chapter Test

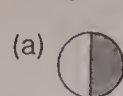
1. Write a fraction.



$\frac{3}{5}$

■ is red.

2. Copy and complete using  $>$  or  $<$ .



(b) 0.2  $<$  0.6

3. How many dollars, dimes, and pennies in \$2.64? *2 dollars, 6 dimes, 4 pennies*

Write as decimals.

4. 1 whole and 3 tenths *1.3*

5. 1 whole and 8 tenths *1.8*

6. 
$$\begin{array}{r} 0.1 \\ + 0.6 \\ \hline \end{array}$$

*0.7*

7. 
$$\begin{array}{r} 0.5 \\ + 0.4 \\ \hline \end{array}$$

*0.9*

8. 
$$\begin{array}{r} \$0.46 \\ + 0.21 \\ \hline \end{array}$$

*\$0.67*

9. 
$$\begin{array}{r} \$0.45 \\ + 0.21 \\ \hline \end{array}$$

*\$0.66*

10. 
$$\begin{array}{r} \$1.45 \\ + 4.32 \\ \hline \end{array}$$

*\$5.77*

11. 
$$\begin{array}{r} 0.8 \\ - 0.1 \\ \hline \end{array}$$

*0.7*

12. 
$$\begin{array}{r} 0.9 \\ - 0.7 \\ \hline \end{array}$$

*0.2*

13. 
$$\begin{array}{r} \$0.56 \\ - 0.44 \\ \hline \end{array}$$

*\$0.12*

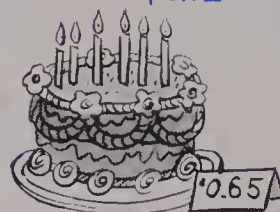
14. 
$$\begin{array}{r} \$1.79 \\ - 0.39 \\ \hline \end{array}$$

*\$1.40*

15. 
$$\begin{array}{r} \$4.65 \\ - 2.31 \\ \hline \end{array}$$

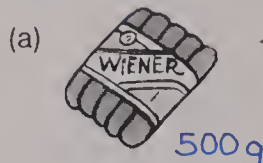
*\$2.34*

16. Candles cost \$0.67.  
Jill gave the clerk \$1.00.  
What coins did she get in her change? *1¢, 1¢, 1¢, 5¢, 25¢*

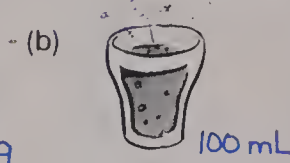


17. Jill gave a \$1.00 bill for a piece of cake.  
What coins did she get in change? *10¢, 25¢*

18. Choose the best one.



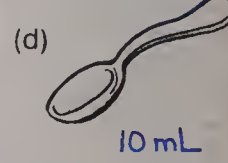
500 kg or 500 g



100 mL or 100 L



4 kg or 4 g



10 L or 10 mL

154 Chapter 5 test

**Using the Book** Each child should do this test independently under supervision. Assistance should be given only when the instructions are not understood. After the work has been corrected, you should provide appropriate remedial work. You may wish to reteach if a large number of children had difficulty with a particular topic or concept.

The following chart will help in this regard. The specific objectives are listed in the Chapter Overview (see page 124).

An alternate Chapter Test can be found in the Holt Mathematics System Duplicating Masters available for use with this grade level.

| Test Item    | Objective | Text Page Number |
|--------------|-----------|------------------|
| 1            | A         | 128              |
| 2            | B         | 127, 130         |
| 3            | G         | 144              |
| 4, 5         | C         | 132              |
| 6, 7, 11, 12 | D         | 133, 134         |
| 8-10, 13-17  | F         | 145, 146, 152    |
| 18(a), 18(c) | E         | 140              |
| 18(b), 18(d) | E         | 137, 138         |

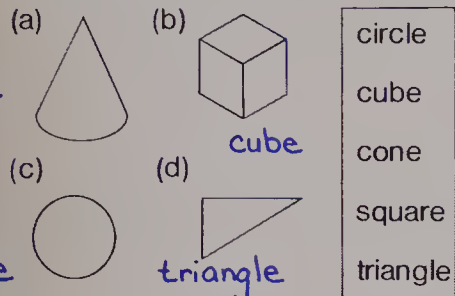
# Cumulative Review

## OBJECTIVE

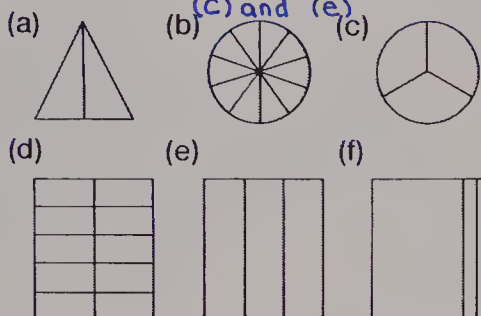
To review and test selected concepts and skills previously covered

|   |  |  |  |   |
|---|--|--|--|---|
| 1. $\begin{array}{r} 45 \\ + 34 \\ \hline 79 \end{array}$ | 2. $\begin{array}{r} 204 \\ + 495 \\ \hline 699 \end{array}$ | 3. $\begin{array}{r} 49 \\ + 98 \\ \hline 147 \end{array}$ | 4. $\begin{array}{r} 304 \\ + 209 \\ \hline 513 \end{array}$ | 5. $\begin{array}{r} 998 \\ + 209 \\ \hline 1207 \end{array}$ |
| 6. $\begin{array}{r} 38 \\ - 15 \\ \hline 23 \end{array}$ | 7. $\begin{array}{r} 658 \\ - 203 \\ \hline 455 \end{array}$ | 8. $\begin{array}{r} 36 \\ - 18 \\ \hline 18 \end{array}$  | 9. $\begin{array}{r} 341 \\ - 160 \\ \hline 181 \end{array}$ | 10. $\begin{array}{r} 802 \\ - 439 \\ \hline 363 \end{array}$ |

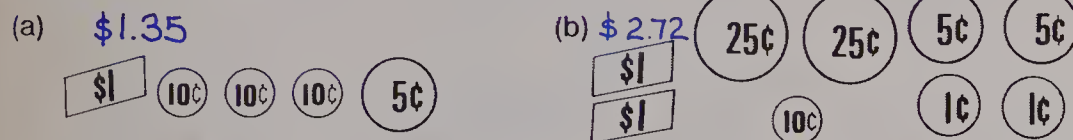
11. Name each shape.



12. Which show thirds? tenths? (b) and (d)



13. Write the amounts.



|   |   |  |  |  |
|---|---|--|--|--|
| 14. $\begin{array}{r} 0.4 \\ + 0.5 \\ \hline 0.9 \end{array}$ | 15. $\begin{array}{r} 0.8 \\ + 0.1 \\ \hline 0.9 \end{array}$ | 16. $\begin{array}{r} \$1.22 \\ + 2.57 \\ \hline \$3.79 \end{array}$ | 17. $\begin{array}{r} \$2.25 \\ + 3.14 \\ \hline \$5.39 \end{array}$ | 18. $\begin{array}{r} \$5.01 \\ + 2.98 \\ \hline \$7.99 \end{array}$ |
| 19. $\begin{array}{r} 0.8 \\ - 0.4 \\ \hline 0.4 \end{array}$ | 20. $\begin{array}{r} 0.9 \\ - 0.3 \\ \hline 0.6 \end{array}$ | 21. $\begin{array}{r} \$0.51 \\ - 0.23 \\ \hline \$0.28 \end{array}$ | 22. $\begin{array}{r} \$5.74 \\ - 1.61 \\ \hline \$4.13 \end{array}$ | 23. $\begin{array}{r} \$6.08 \\ - 3.05 \\ \hline \$3.03 \end{array}$ |

Chapters 1-5: cumulative review 155

**Using the Book** This page may be used for diagnostic and remedial as well as review purposes. Children should check their work, correct any errors, and review the pages that contain any problems of the type they missed. Some children can do this on their own while others may need help. If a large number of children have a particular problem incorrect, you may want to reteach that topic to the groups, then assign a duplicated worksheet to reinforce that topic or refer to an appropriate skill card in the BFA Computational Skills Kit I.

| Test Item | Text Page Number |
|-----------|------------------|
| 1-5       | 54               |
| 6-10      | 67, 68           |
| 11        | 81, 94           |
| 12        | 126              |
| 13        | 143              |
| 14, 15    | 133              |
| 19, 20    | 134              |
| 16-18     | 145              |
| 21-23     | 146              |



# CHAPTER 6 OVERVIEW

This chapter reviews and expands on basic concepts involving multiplication and division up to  $5 \times 5$  and related sentences in division. The art theme of this chapter is the circus.

## OBJECTIVES

- A To review the meaning of multiplication (repeated addition) and division (repeated subtraction)
- B To multiply using facts up to  $5 \times 5$
- C To divide using facts up to  $25 \div 5$
- D To introduce multiplying by zero
- E To solve word problems

## BACKGROUND

It can be shown that multiplication is related to addition because  $5 \times 3$  means 3 added 5 times or  $3 + 3 + 3 + 3 + 3 = 15$ . In turn, division can be shown to be the inverse of multiplication. For example, dividing by 3 undoes what multiplying by 3 did in the first place.

$$\begin{array}{ccc} 5 \times 3 = 15 & & 15 \div 3 = 5 \\ \underbrace{\hspace{1.5cm}} & & \underbrace{\hspace{1.5cm}} \end{array}$$

Ensuring that the children have a good understanding of multiplication will provide a basis for future work in division. Use of arrays (pictorial representations) may help the children to bridge the gap to abstract questions and should be used to reinforce the process of multiplication.

## MATERIALS

concrete materials as indicated for each lesson

array boards (can be made from graph paper)  
gummed stickers for arrays

## CAREER AWARENESS

### Animal Trainer [183]

A person in this job is responsible for the training and often the care of animals. This involves understanding the temperaments of different animals and the amount of training that one can expect to be able to do. An animal trainer may learn how to train animals through a course or by working with someone already in this kind of job.

When using this particular page, it may be beneficial to have the children discuss their experiences at the circus and make a chart story to accompany this discussion.

Have the children classify animals as to those which would be under the supervision of an animal trainer. Discuss the difference between an "animal tamer" and an "animal trainer". This could be the basis of a bulletin board display and could lead to further discussions on wild and tame or domestic animals.

This unit could be expanded further as to the type of food different animals eat and their physical features.

### Example

|                 |   |       |
|-----------------|---|-------|
| sharp teeth and | } | meat  |
| claws           |   |       |
| blunt teeth and | } | grass |
| hooves          |   |       |

# What is Multiplication?

Count the animals.

2 Camels  
2 Elephants  
2 Ostriches  
+2 Monkeys

How many animals?

$$2 + 2 + 2 + 2 = 8 \text{ Animals.}$$

How many pairs of animals?  $\rightarrow 4$

How many animals in a pair?  $\rightarrow 2$

4 sets of 2  $\rightarrow 8$ .

You write:  $4 \times 2 = 8$ .

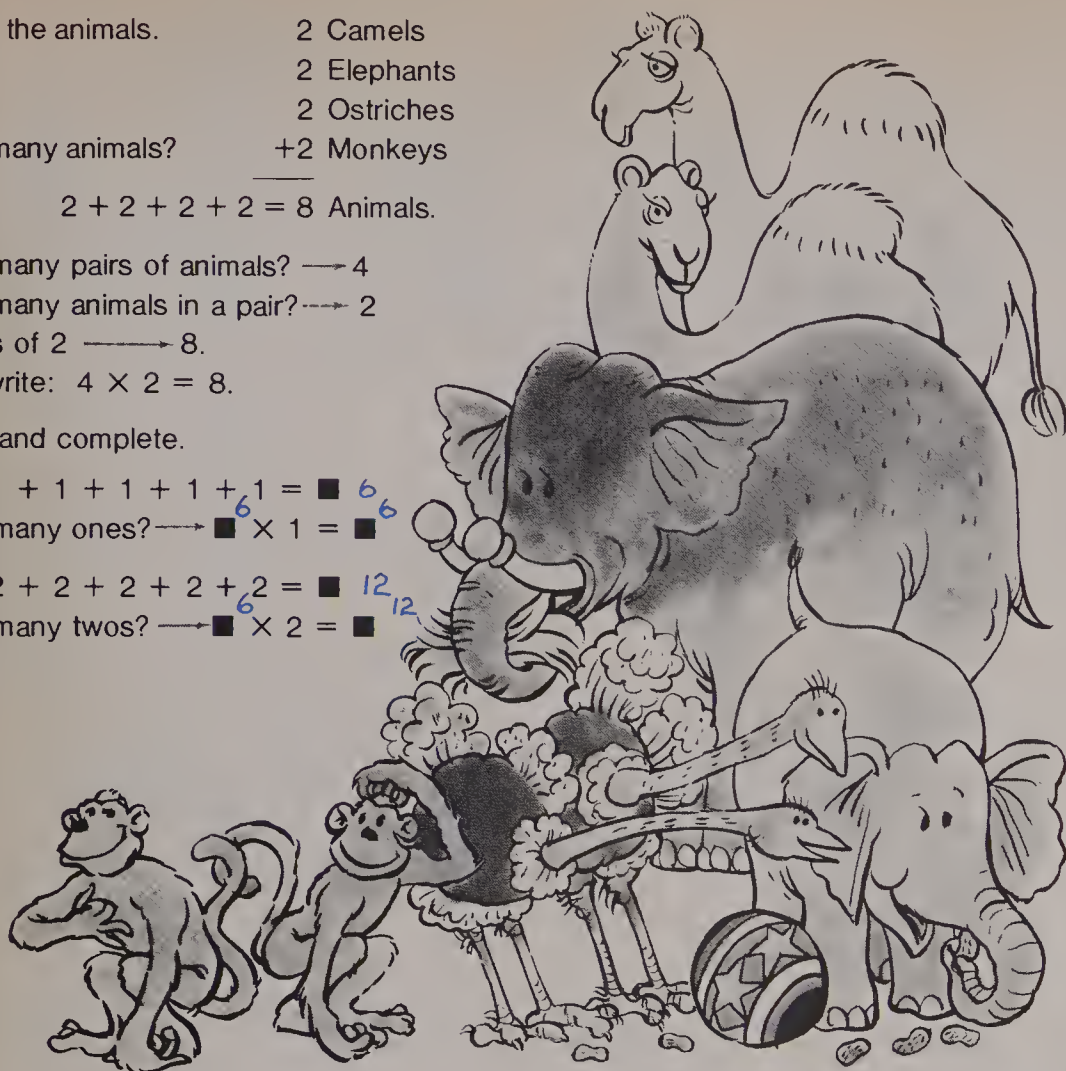
Copy and complete.

$$1 + 1 + 1 + 1 + 1 + 1 = \blacksquare \quad 6$$

$$\text{How many ones?} \rightarrow \blacksquare \times 1 = \blacksquare \quad 6$$

$$2 + 2 + 2 + 2 + 2 + 2 = \blacksquare \quad 12$$

$$\text{How many twos?} \rightarrow \blacksquare \times 2 = \blacksquare \quad 12$$



Meaning of multiplication 157

**Using the Book** Draw the child's attention to the artwork. Ask, "How many camels do you see on this page? (2)" Repeat this for the elephants, ostriches, and monkeys (2 each) finishing with "How many animals in all? (8)"

Read through the first half of the information on the page with the children. Be sure that they understand that there are two ways to express the total number of animals on the page:

- (1) the long way (repeated addition)  $2 + 2 + 2 + 2 = 8$  and
- (2) the shorter, faster method (multiplication)  $4 \times 2 = 8$ .

Point out that this quicker method requires a different symbol " $\times$ " and that  $4 \times 2 = 8$  is said "four times two equals eight".

Have the children copy the two-part exercises in their workbooks, inserting the correct number for each  $\blacksquare$ . Be certain counters are available for those who need them.

## OBJECTIVE

To introduce the meaning of multiplication

## PACING

Level A All  
Level B All  
Level C All

## VOCABULARY

multiplication, camels, elephants, ostriches, monkeys

## MATERIALS

counters

## SUGGESTIONS

**Initial Activity** Allow ample time for children to manipulate materials to develop skills and concepts of beginning multiplication.

Have the children use counters to illustrate the following repeated addition story.

$$2 + 2 + 2 + 2 = 8$$

Discuss and make a chart as follows:

$$4 \text{ twos} = 8$$

$$4 \text{ "groups of" } 2 = 8$$

$$4 \times 2 = 8$$

Reinforce the fact that " $\times$ " is the symbolic way of writing "groups of."

Do several examples with the children and record the results as above.

## ACTIVITIES

1. Children use catalogue or magazine cutouts to find groups of 2, 3, 4, . . .

2. Children find groups of objects in the classroom. Record findings by using repeated addition and multiplication equations.

3. Teacher prepares ten cards. Use repeated addition equations (unsolved) on five cards and their multiplication counterparts (unsolved) on the remaining cards. Scatter cards on table and have children match the equations and determine answers.

4. Make a bulletin board display of pairs of different animals.

## OBJECTIVE

To provide practice in addition, subtraction, and counting

## PACING

Level A All

Level B All

Level C 6-10, 16-20, 25-30

## RELATED AIDS

BFA COMP LAB I—25.

## EXTRA PRACTICE

Add.

$$\begin{array}{r} 1. \quad 75 \\ + 23 \\ \hline \end{array}$$

$$\begin{array}{r} 2. \quad 64 \\ + 34 \\ \hline \end{array}$$

$$\begin{array}{r} 3. \quad 77 \\ + 16 \\ \hline \end{array}$$

$$\begin{array}{r} 4. \quad 37 \\ + 54 \\ \hline \end{array}$$

$$\begin{array}{r} 5. \quad 35 \\ + 56 \\ \hline \end{array}$$

$$\begin{array}{r} 6. \quad 48 \\ + 42 \\ \hline \end{array}$$

$$\begin{array}{r} 7. \quad 372 \\ + 116 \\ \hline \end{array}$$

$$\begin{array}{r} 8. \quad 544 \\ + 335 \\ \hline \end{array}$$

$$\begin{array}{r} 9. \quad 638 \\ + 224 \\ \hline \end{array}$$

$$\begin{array}{r} 10. \quad 568 \\ + 327 \\ \hline \end{array}$$

$$\begin{array}{r} 11. \quad 674 \\ + 287 \\ \hline \end{array}$$

$$\begin{array}{r} 12. \quad 383 \\ + 568 \\ \hline \end{array}$$

Subtract.

$$\begin{array}{r} 1. \quad 25 \\ - 9 \\ \hline \end{array}$$

$$\begin{array}{r} 2. \quad 19 \\ - 7 \\ \hline \end{array}$$

$$\begin{array}{r} 3. \quad 57 \\ - 24 \\ \hline \end{array}$$

$$\begin{array}{r} 4. \quad 83 \\ - 61 \\ \hline \end{array}$$

$$\begin{array}{r} 5. \quad 81 \\ - 46 \\ \hline \end{array}$$

$$\begin{array}{r} 6. \quad 47 \\ - 28 \\ \hline \end{array}$$

$$\begin{array}{r} 7. \quad 347 \\ - 129 \\ \hline \end{array}$$

$$\begin{array}{r} 8. \quad 764 \\ - 438 \\ \hline \end{array}$$

$$\begin{array}{r} 9. \quad 643 \\ - 251 \\ \hline \end{array}$$

$$\begin{array}{r} 10. \quad 587 \\ - 195 \\ \hline \end{array}$$

$$\begin{array}{r} 11. \quad 328 \\ - 289 \\ \hline \end{array}$$

$$\begin{array}{r} 12. \quad 765 \\ - 587 \\ \hline \end{array}$$

## Tune Up

Add.

$$\begin{array}{r} 1. \quad 43 \\ + 24 \\ \hline 67 \end{array}$$

$$\begin{array}{r} 2. \quad 68 \\ + 31 \\ \hline 99 \end{array}$$

$$\begin{array}{r} 3. \quad 56 \\ + 23 \\ \hline 79 \end{array}$$

$$\begin{array}{r} 4. \quad 46 \\ + 35 \\ \hline 81 \end{array}$$

$$\begin{array}{r} 5. \quad 78 \\ + 13 \\ \hline 91 \end{array}$$

$$\begin{array}{r} 6. \quad 324 \\ + 592 \\ \hline 916 \end{array}$$

$$\begin{array}{r} 7. \quad 653 \\ + 248 \\ \hline 901 \end{array}$$

$$\begin{array}{r} 8. \quad 261 \\ + 369 \\ \hline 630 \end{array}$$

$$\begin{array}{r} 9. \quad 254 \\ + 468 \\ \hline 722 \end{array}$$

$$\begin{array}{r} 10. \quad 427 \\ + 396 \\ \hline 823 \end{array}$$

Subtract.

$$\begin{array}{r} 11. \quad 16 \\ - 9 \\ \hline 7 \end{array}$$

$$\begin{array}{r} 12. \quad 27 \\ - 8 \\ \hline 19 \end{array}$$

$$\begin{array}{r} 13. \quad 35 \\ - 13 \\ \hline 22 \end{array}$$

$$\begin{array}{r} 14. \quad 64 \\ - 26 \\ \hline 38 \end{array}$$

$$\begin{array}{r} 15. \quad 80 \\ - 23 \\ \hline 57 \end{array}$$

$$\begin{array}{r} 16. \quad 631 \\ - 50 \\ \hline 581 \end{array}$$

$$\begin{array}{r} 17. \quad 475 \\ - 207 \\ \hline 268 \end{array}$$

$$\begin{array}{r} 18. \quad 528 \\ - 239 \\ \hline 289 \end{array}$$

$$\begin{array}{r} 19. \quad 365 \\ - 186 \\ \hline 179 \end{array}$$

$$\begin{array}{r} 20. \quad 807 \\ - 438 \\ \hline 369 \end{array}$$

Count by 2's.

$$21. \quad 2, 4, \boxed{\phantom{00}}, \boxed{\phantom{00}}, \boxed{\phantom{00}}, \boxed{\phantom{00}}, \boxed{\phantom{00}}, \boxed{\phantom{00}} \quad 6, 8, 10, 12, 14, 16$$

$$22. \quad 6, 8, \boxed{\phantom{00}}, \boxed{\phantom{00}}, \boxed{\phantom{00}}, \boxed{\phantom{00}}, \boxed{\phantom{00}}, \boxed{\phantom{00}} \quad 10, 12, 14, 16, 18, 20$$

Count by 3's.

$$23. \quad 3, 6, \boxed{\phantom{00}}, \boxed{\phantom{00}}, \boxed{\phantom{00}}, \boxed{\phantom{00}}, \boxed{\phantom{00}}, \boxed{\phantom{00}} \quad 9, 12, 15, 18, 21, 24$$

$$24. \quad 12, 15, \boxed{\phantom{00}}, \boxed{\phantom{00}}, \boxed{\phantom{00}}, \boxed{\phantom{00}}, \boxed{\phantom{00}}, \boxed{\phantom{00}} \quad 18, 21, 24, 27, 30, 33$$

$$\begin{array}{r} 25. \quad 2 \\ 2 \\ + 2 \\ \hline 6 \end{array}$$

$$\begin{array}{r} 26. \quad 3 \\ 3 \\ + 3 \\ \hline 9 \end{array}$$

$$\begin{array}{r} 27. \quad 4 \\ 4 \\ + 4 \\ \hline 12 \end{array}$$

$$\begin{array}{r} 28. \quad 5 \\ 5 \\ + 5 \\ \hline 15 \end{array}$$

$$\begin{array}{r} 29. \quad 1 \\ 1 \\ + 1 \\ \hline 3 \end{array}$$

$$\begin{array}{r} 30. \quad 0 \\ 0 \\ + 0 \\ \hline 0 \end{array}$$

158 Addition and subtraction practice, counting practice

**Using the Book** The children should work independently on these questions. If any children have unusual difficulty with this page, you may want to set up remedial work based on the type of facts found on this page.



# Multiplication Stories



3 groups of 4 horses.  
 $3 \times 4 = 12$  horses in all.

When you **multiply** two numbers, the answer is called the **product**.

$3 \times 4 = 12$  ← Multiplication story

12 is the product.

Write addition and multiplication stories for these.

1.  $3 + 3 + 3 + 3 = 12$      $4 \times 3 = 12$

2.  $2 + 2 + 2 = 6$      $3 \times 2 = 6$

3.  $5 + 5 = 10$      $2 \times 5 = 10$

4.  $3 + 3 + 3 = 9$      $3 \times 3 = 9$

Write the addition stories for these.

5.  $3 + 3 = 6$     6.  $4 + 4 + 4 = 12$     7.  $5 + 5 = 10$     8.  $2 + 2 + 2 + 2 = 8$

Multiplication sentences 159

**Using the Book** Make the children aware of the artwork on this page. Ask, "How many groups of horses are there? (3)" "How many horses are in each group? (4)" "How many horses are there in all? (12)" Point out that one can use the shorter method to write this —  $3 \times 4 = 12$ . Say, "When we write this down we multiply  $3 \times 4$  and we get the answer 12. We call this answer the *product*."

Refer to the rule: "When you multiply two numbers, the answer is called the product." This rule can be written on a separate strip of paper to be posted as a "Rule for Multiplication".

Teacher and children work through Exercises 1 and 2 together and check answers in the back of the book.

Have the children do Exercises 3-8 in workbooks on their own. Counters should be available for those who need them.

## OBJECTIVE

To write multiplication sentences and the related addition sentences

## PACING

Level A All  
 Level B All  
 Level C All

## VOCABULARY

groups of, multiply, product

## MATERIALS

counters

## SUGGESTIONS

**Initial Activity** Use counters to demonstrate several multiplication stories. When recording, use a different colour for "groups of" and "×" to emphasize the fact that "×" is a symbolic way of representing "groups of", e.g.,  $3 \times 2$ .

Refer to the relationship between repeated addition and multiplication. Do several examples before assigning the page.

## ACTIVITIES

1. Have several cards made up with pictures of repeated addition sets on each card. One child draws a card and must write the repeated addition story and the multiplication story that is represented. Another child checks the answer from the back of the card (or from an answer sheet). The children take turns.

*Example*



The child writes:

$2 + 2 + 2 + 2 = 8$   
 4 groups of 2 = 8  
 $4 \times 2 = 8$

2. Make up several cards using repeated addition equations (solved) and multiplication equations (unsolved). Children give answers for each ■, i.e.,

$3 + 3 + 3 = 9$   
 $3 \times 3 = \blacksquare$   
 $4 + 4 = 8$   
 $2 \times 4 = \blacksquare$   
 $1 + 1 + 1 + 1 + 1 = 5$   
 $5 \times 1 = \blacksquare$

3. Give each child 25 counters. Have each child:  
 (a) display an array;  
 (b) write the repeated addition sentence for the array;  
 (c) write the multiplication sentence for the array.

## OBJECTIVE

To write the multiplication stories for multiplying by 2

## PACING

Level A All  
Level B All  
Level C All

## VOCABULARY

multiplying

## MATERIALS

counters, cardboard circles

## SUGGESTIONS

**Initial Activity** Review counting by 2's. Have the children put down 4 circles and place 2 counters in each. Have them count to find how many counters. Ask them how many times they counted 2 to get 8. Bring out the fact that counting by 2's helps them to know the multiplication stories for 2.

Do several examples using the circles and counters.

## ACTIVITIES

1. Have many circles made up with a pattern of 2 drawn or stamped on each. The children count out a number of circles and write the multiplication story for 2.

*Example*

The child takes 6 circles.



6 groups of 2 = 12  
 $6 \times 2 = 12$

2. Have a series of cards made up reinforcing counting by 2.

*Example*

2, 4, \_\_, \_\_, 10

2, \_\_, 6, \_\_, \_\_, 12

\_\_, \_\_, \_\_, 8, 10, 12

3. Have children draw pictures for each given multiplication story.

*Example*

$3 \times 2 = 6$

$7 \times 2 = 14$

etc.

## Multiplying by 2



The children are going to the circus.  
5 groups of children.  
2 children in a group.  
10 children are going to the circus.

$$5 \times 2 = 10$$

Write these stories for multiplying by 2.

1.  $3 \times 2 = 6$

2.  $7 \times 2 = 14$

3.  $2 \times 2 = 4$

4.  $8 \times 2 = 16$

5.  $4 \times 2 = 8$

6.  $6 \times 2 = 12$

7.  $5 \times 2 = 10$

8.  $9 \times 2 = 18$

160 Multiplying by 2

**Using the Book** Using the artwork as an introduction ask, "What are the children doing?" "Where do you think they are going?" "How many groups of children are there?" "How many children in each group?" "How many children are there in all?" "What multiplication story can we write down?"

Recall the multiplication rule: "When you multiply two numbers, the answer is called the product." Using  $5 \times 2 = 10$  determine which two numbers are being multiplied; which number is the product?

Work through Exercises 1 and 2 with children to determine what multiplication story goes with each picture. Check answers in the back of the book.

Have children do Exercises 4-8 in workbooks giving multiplication story for each.



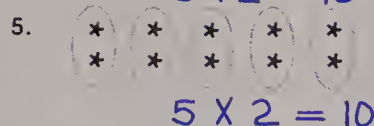
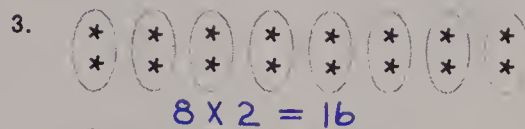
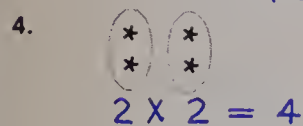
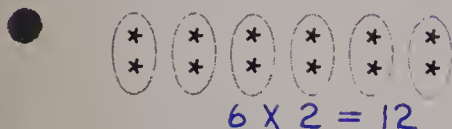
# Arrays



How many rows?  
How many \*'s in each row?  
How many \*'s altogether?

$$3 \times 2 = \blacksquare 6$$

Write a multiplication story for each array.



8 x 2 =  $\blacksquare$  16    8. 3 x 2 =  $\blacksquare$  6    9. 5 x 2 =  $\blacksquare$  10    10. 9 x 2 =  $\blacksquare$  18

11. 10 x 2 =  $\blacksquare$  20    12. 1 x 2 =  $\blacksquare$  2    13. 3 x 2 =  $\blacksquare$  6    14. 2 x 2 =  $\blacksquare$  4

15. 7 x 2 =  $\blacksquare$  14    16. 9 x 2 =  $\blacksquare$  18    17. 4 x 2 =  $\blacksquare$  8    18. 1 x 2 =  $\blacksquare$  2

19. 6 x 2 =  $\blacksquare$  12    20. 4 x 2 =  $\blacksquare$  8    21. 2 x 2 =  $\blacksquare$  4    22. 5 x 2 =  $\blacksquare$  10

Multiplying by 2 161

**Using the Book** In examining the picture ask, "How many rows do you see? (3)" "How many stars are in each row? (2)" "How many stars do you see in all? (6)" "What multiplication story could we use to accompany this picture? ( $3 \times 2 = 6$ )"

Tell children that this picture has a special name called an "array". Say it is used to go with multiplication stories so that one can understand the story better. Have children show an array for 2 with their counters and tell a multiplication story that goes with it.

Examine Exercises 1 and 2. Have children write answers filling in  $\blacksquare \times \blacksquare = \blacksquare$  in their workbooks. Have them check back of book to verify correct answer.

Assign Exercises 3-6. Stop! Check work!

Examine Exercise 7. Tell children that these multiplication stories do not have arrays, but that if they need to, to use counters to make arrays to help with answers. Do Exercise 7 ( $8 \times 2 = \blacksquare$ ) on the chalkboard — filling in the  $\blacksquare$  only.

Assign Exercises 8-22.

## OBJECTIVE

To reinforce multiplying by 2 through the use of arrays

## PACING

Level A All  
Level B All  
Level C 5-22

## VOCABULARY

arrays

## MATERIALS

counters, egg cartons, grid paper

## RELATED AIDS

BFA COMP LAB I—88.

## SUGGESTIONS

**Initial Activity** Use counters and egg cartons or grid paper to establish the idea of an array. Then, diagram this idea of an array and record numerically.



3 rows.



2 in each row.



3 groups of 2 = 6.

$3 \times 2 = 6$

## ACTIVITIES

1. Have the children work independently and use their counters and egg cartons or grid paper to make more arrays for 2 and record them as in the example above.

2. Refer to Activity 4, page 157. Ask, "There are 3 kinds of animals (in pairs). How many altogether? ( $3 \times 2 = 6$ )" "There are 5 kinds of animals. How many altogether?" (Put a circle around the animals in the bulletin board display.) Continue for other numbers.

3. Prepare cards with mini-problems on each. Have children illustrate an array for each.

*Example*

8 boxes.  
2 balloons in each box.  
16 balloons in all.  
 $8 \times 2 = 16$

4. Have cards prepared with arrays. Children are to give a multiplication story for each.

*Example*





## OBJECTIVE

To write the multiplication stories for multiplying by 3

## PACING

Level A All  
Level B All  
Level C All

## VOCABULARY

giraffes

## MATERIALS

counters, cardboard triangles

## RELATED AIDS

BFA COMP LAB I—89.

## SUGGESTIONS

**Initial Activity** Review counting by 3's. Have the children put down 4 triangles and place 3 counters on each (one on each corner). Have them count to find how many counters. Ask them how many times they counted 3 to get 12.

Reinforce the fact that counting by 3's helps them to know the multiplication stories for 3.

## ACTIVITIES

1. Make up several triangles with a pattern of 3 drawn or stamped on each. The children count out a number of triangles and write the multiplication story for 3.

*Example*

The child takes 3 triangles.



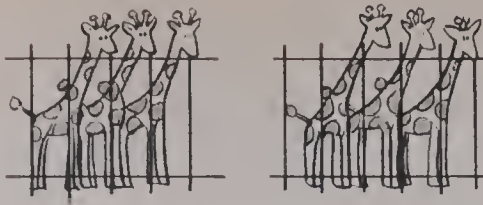
3 groups of 3 = 9  
 $3 \times 3 = 9$

2. Use the "Missing Numbers" game from the Activity Reservoir for  $3 \times \blacksquare$  drill.




3. Working with a partner, one child has counters and the other child records. One child shows an array with counters and the other child records the multiplication story. The partners switch activities.


## Multiplying by 3




3 giraffes in each cage.  
2 cages.  
 $2 \times 3 = 6$  giraffes altogether.

Write the multiplication stories for these.

1.   $3 \times 3 = \blacksquare 9$

2.   $4 \times 3 = \blacksquare 12$

3.   $1 \times 3 = \blacksquare 3$

4.  $2 \times 3 = \blacksquare 6$       5.  $5 \times 3 = \blacksquare 15$       6.  $1 \times 3 = \blacksquare 3$

7.  $3 \times 3 = \blacksquare 9$       8.  $4 \times 3 = \blacksquare 12$       9.  $2 \times 3 = \blacksquare 6$

162 Multiplying by 3

**Using the Book** Focus the children's attention on the artwork. Ask, "How many giraffes do you see in each cage? (3)" "How many cages do you see? (2)" "How many giraffes are there in all? (6)" "What multiplication story can we write for this? ( $2 \times 3 = 6$ )"

Examine Exercise 1 together. Check back of book to verify answer for  $\blacksquare$ . Assign Exercises 2-9.

## EXTRA PRACTICE

$1 \times 3$        $2 \times 3$   
 $3 \times 3$        $4 \times 3$   
 $5 \times 3$        $6 \times 3$   
 $7 \times 3$        $8 \times 3$


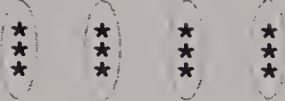
# Arrays







5 groups of 3.

$$5 \times 3 = 15$$

Write the multiplication stories for these.

1.   $3 \times 3 = 9$  2.   $4 \times 3 = 12$

3.   $5 \times 3 = 15$  4.   $2 \times 3 = 6$

5.   $6 \times 3 = 18$  6.   $1 \times 3 = 3$

Copy and complete.

4.  $4 \times 2 = \blacksquare 8$  8.  $3 \times 3 = \blacksquare 9$  9.  $5 \times 3 = \blacksquare 15$  10.  $1 \times 3 = \blacksquare 3$
11.  $5 \times 2 = \blacksquare 10$  12.  $4 \times 3 = \blacksquare 12$  13.  $2 \times 3 = \blacksquare 6$  14.  $3 \times 2 = \blacksquare 6$
- 4 seals in each pool.  
2 pools.  
How many seals? 8
- 3 monkeys in each tree.  
3 trees.  
How many monkeys? 9

Multiplying by 2 and 3 163

**Using the Book** Have the children observe the array at the top of the page. Ask, "How many groups are there?" "How many stars are in each group?" "How many stars are there altogether?" "What multiplication story can we write for this?"

Give children sample mini-problems:

- |                     |                     |
|---------------------|---------------------|
| 5 children.         | 3 dogs.             |
| 2 popsicles each.   | 2 toy bones each.   |
| How many popsicles? | How many toy bones? |

Assign page for independent work.

## OBJECTIVE

To multiply by 3

## PACING

Level A All  
Level B All  
Level C All

## VOCABULARY

seals, monkeys

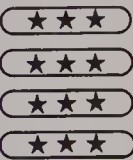
## RELATED MATERIALS

HMS—DM45.

## SUGGESTIONS

**Initial Activity** Use counters to reinforce the idea of an array. Record the array pictorially and then numerically.

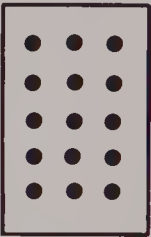
*Example*

|   |   |
|---|---|
|  | 4 rows.<br>3 in each row.<br>4 groups of 3 = 12.<br>$4 \times 3 = 12$ |
|---|---|

## ACTIVITIES

1. Make a set of Activity Cards showing arrays of 3's. Have the child pick a card. The child writes the multiplication story that goes with the array and checks answer on the back of the card (or on an answer card).

*Example*

|   |   |
|---|---|
|  | 5 rows.<br>3 in each row.<br>5 groups of 3 = 15.<br>$5 \times 3 = 15$ |
|---|---|

2. Use "The Multiplication Game" in the Activity Reservoir. Modify to match the skills in this section.

★3. Prepare a card.

I am thinking of a number.  
I multiply it by 3.  
Then I add 2.  
The answer is 17.  
What is the number? (5)

OBJECTIVE

To review and reinforce counting by fours

PACING

- Level A All
- Level B All
- Level C All

VOCABULARY

fours, corners

ACTIVITIES

- 1. Have the children decide which of the following could be put into a "4's box". Copy and complete the "4's box".  
8 16 24 18 12 26 4  
32 20 27 13 28 36 38
- 2. Repeat Activity 1 on page 163 for arrays of 4's.
- 3. Prepare small cards which show numbers counting by 4's to 50.

4

12

16

24

etc.

Have the children arrange them in correct order using clothes pins on a clothes line (string).

Fours



- 1. Take a square.  
How many corners does it have? 4
- 2. Draw some squares.

Put a dot on each corner and write the number of corners under your pictures like this.

|                            |                            |                               |               |               |               |
|----------------------------|----------------------------|-------------------------------|---------------|---------------|---------------|
| <div>12</div> <div>4</div> | <div>56</div> <div>8</div> | <div>910</div> <div>11?</div> |               |               |               |
| <div>28</div>              | <div>32</div>              | <div>36</div>                 | <div>40</div> | <div>44</div> | <div>48</div> |

Finish these.

- 3. 4, 8, 12, ■, ■, ■ 16, 20, 24  
12, 16, 20, ■, ■, ■ 24, 28, 32  
20, 24, 28, ■, ■, ■ 32, 36, 40  
28, 32, 36, ■, ■, ■ 40, 44, 48
- 4. 16, 20, ■, ■, ■, ■ 24, 28, 32, 36  
24, 28, ■, ■, ■, ■ 32, 36, 40, 44  
32, 36, ■, ■, ■, ■ 40, 44, 48, 52  
36, 40, ■, ■, ■, ■ 44, 48, 52, 56

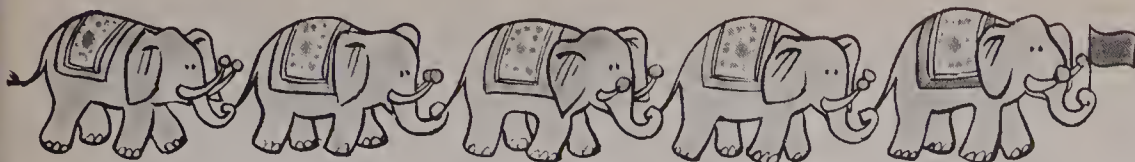
Using the Book Put a counter on each corner of some squares and record the total number of counters used. Question the children as to why these numbers represent counting by 4's. Have the children suggest other ways they could demonstrate counting by 4's.



# Multiplying by 4

Each elephant has 4 legs.

How many legs do all the elephants have altogether?



|                  |          |                   |
|------------------|----------|-------------------|
| 1 elephant has   | 4 legs.  | $1 \times 4 = 4$  |
| 2 elephants have | 8 legs.  | $2 \times 4 = 8$  |
| 3 elephants have | 12 legs. | $3 \times 4 = 12$ |
| 4 elephants have | 16 legs. | $4 \times 4 = 16$ |
| 5 elephants have | 20 legs. | $5 \times 4 = 20$ |

Write the multiplication stories for these.

1.  $3 \times 4 = \blacksquare 12$

2.  $5 \times 4 = \blacksquare 20$

3.  $\blacksquare \times \blacksquare = \blacksquare$   
 $4 \times 4 = 16$

4.  $\blacksquare \times \blacksquare = \blacksquare$   
 $2 \times 4 = 8$

Copy and complete.

5.  $1 \times 4 = \blacksquare 4$  6.  $5 \times 3 = \blacksquare 15$  7.  $5 \times 4 = \blacksquare 20$  8.  $3 \times 3 = \blacksquare 9$   
9.  $3 \times 4 = \blacksquare 12$  10.  $1 \times 4 = \blacksquare 4$  11.  $2 \times 4 = \blacksquare 8$  12.  $4 \times 3 = \blacksquare 12$   
13.  $4 \times 4 = \blacksquare 16$  14.  $4 \times 2 = \blacksquare 8$  15.  $5 \times 4 = \blacksquare 20$  16.  $3 \times 4 = \blacksquare 12$

Multiplying by 4 165

**Using the Book** While noting artwork, ask, "How many legs does 1 elephant have? (4)" "What multiplication story could we write for that? ( $1 \times 4 = 4$ )"

Continue questioning in same manner for:

- 2  $2 \times 4 = 8$   
3  $3 \times 4 = 12$   
4  $4 \times 4 = 16$   
5  $5 \times 4 = 20$ .

Have the children write multiplication equations to accompany pictures and complete to bottom of page by filling in each  $\blacksquare$ . Counters should be available for those needing them.

## OBJECTIVE

To write the multiplication stories for multiplying by 4

## PACING

Level A All  
Level B All  
Level C All

## VOCABULARY

elephant

## RELATED MATERIALS

BFA COMP LAB I—90.

## SUGGESTIONS

**Initial Activity** Review counting by 4's. Have the children put down 3 squares and place 4 counters on each (one on each corner). Have them count to find how many counters. Ask them how many times they counted 4 to get 12.

Reinforce the fact that counting by 4's helps them to know the multiplication stories for 4.

## ACTIVITIES

1. Make up several squares with a pattern of 4 drawn or stamped on each. The children choose a number of squares and write the corresponding multiplication story for 4.

*Example*

The child takes 4 squares.



4 groups of 4 = 16  
 $4 \times 4 = 16$

2. Prepare and distribute a blank  $3 \times 3$  grid. Have each child write a number in each space from a list such as: 4, 8, 12, 16, 20, 3, 6, 9, 12, 15, 18, 21; so each child has a "personalized grid". Be sure: (a) each child has 9 numbers and (b) numbers are not repeated. Play "Silent Bingo" by holding up a corresponding multiplication fact card:  $3 \times 4$ .

Usual Bingo rules apply.

3. Make card(s) with equations reviewing previous work.

|                 |              |              |                                 |
|-----------------|--------------|--------------|---------------------------------|
| $2 \times 3$    | $1 + 5$      | $6 + 0$      | If answer = 6<br>colour green.  |
| $4 \times 2$    | $3 \times 2$ | $3 + 3$      |                                 |
| $2 + 2 + 2 + 2$ | $3 + 5$      | $2 \times 4$ | If answer = 8<br>colour yellow. |

## OBJECTIVE

To review multiplying by 2, 3, and 4

## PACING

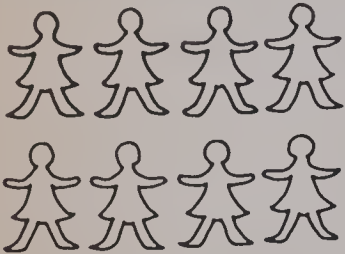
Level A All

Level B All

Level C All

## SUGGESTIONS

**Initial Activity** Set up a situation with 8 children in 2 rows of 4 children. Record the situation pictorially and then numerically as follows.

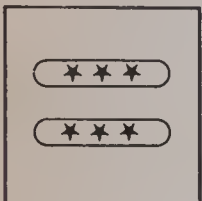


2 rows.  
4 in each row.  
2 groups of 4 = 8.  
 $2 \times 4 = 8$

## ACTIVITIES

1. Make up a set of cards showing arrays for 4. Add these to those made on pages 163 and 164. The children choose a card and write the corresponding multiplication story.

*Example*



2 groups of 3 = 6  
 $2 \times 3 = 6$

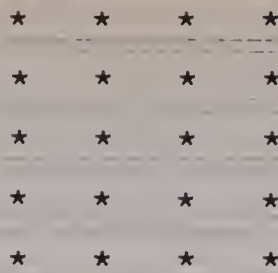


3 groups of 4 = 12  
 $3 \times 4 = 12$

2. Play "Silent Bingo" as outlined on page 165, Activity 2.

3. Use the "Shuffle Numbers" game, "Missing Numbers" game, and/or "Patchwork Quilt" game in the Activity Reservoir. Modify to match the skills in this section.

## Arrays for 4



How many rows?

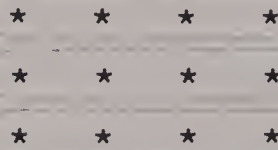
How many in each row?

How many altogether?

$$5 \times 4 = \blacksquare 20$$

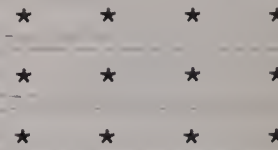
Write a multiplication story for each.

1.



$$3 \times 4 = 12$$

2.



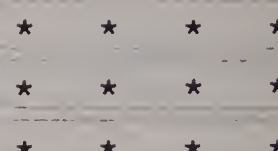
$$4 \times 4 = 16$$

3.



$$2 \times 4 = 8$$

4.



$$5 \times 4 = 20$$

Copy and complete.

5.

$$3 \times 4 = \blacksquare 12$$

6.

$$5 \times 4 = \blacksquare 20$$

7.

$$2 \times 4 = \blacksquare 8$$

8.

$$3 \times 3 = \blacksquare 9$$

9.

$$4 \times 4 = \blacksquare 16$$

10.

$$5 \times 3 = \blacksquare 15$$

11.

$$2 \times 3 = \blacksquare 6$$

12.

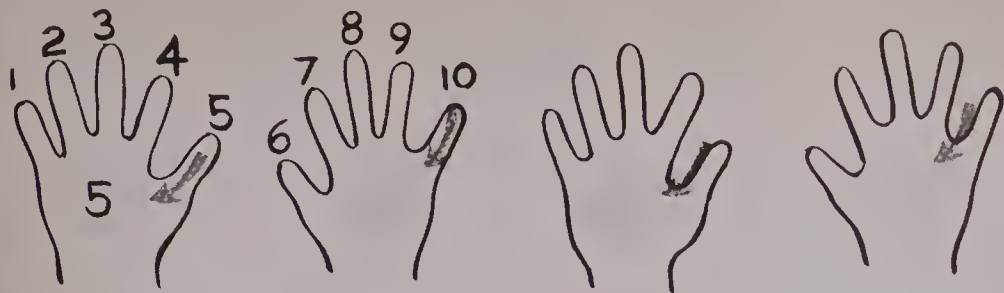
$$8 \times 2 = \blacksquare 16$$

**Using the Book** Draw children's attention to the array. Ask, "How many rows do you see? (5)" "How many stars are in each row? (4)" "How many stars are there in all? (20)" "What multiplication story can we write to go with this? ( $5 \times 4 = 20$ )"

Have children write stories for each array on the page and copy equations at the bottom into their workbooks and solve.

# Fives

Trace your hands and number your fingers like this.



These are **tally marks**.

How many lines are used in a **tally**?

How many lines are in these?

- |    |  |  |  |    |    |    |
|----|--|--|--|----|----|----|
| 1. |  |  |  |    |    | 25 |
| 2. |  |  |  |    |    | 30 |
| 3. |  |  |  | 15 |    |    |
| 4. |  |  |  |    |    | 40 |
| 5. |  |  |  |    | 20 |    |
| 6. |  |  |  |    |    | 35 |

Can you find a pattern?

Write the pattern.

Finish these.

- |    |                    |                |     |                     |            |
|----|--------------------|----------------|-----|---------------------|------------|
| 7. | 5, 10, ■, ■, ■, ■  | 15, 20, 25, 30 | 8.  | 20, 25, 30, ■, ■, ■ | 35, 40, 45 |
| 9. | 15, 20, ■, ■, ■, ■ | 25, 30, 35, 40 | 10. | 30, 35, ■, ■, ■     | 40, 45, 50 |

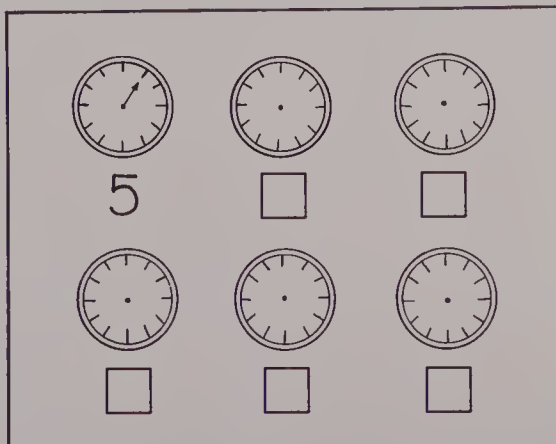
Counting by fives 167

**Using the Book** Before assigning the page, introduce the idea of a tally. Relate the final stroke on a tally to the "tying off" of a group of five.

The exercises are fairly self-explanatory. Be certain children know how to answer if responses are being recorded in a workbook. The page lends itself well to an *oral* introduction to page 168.

Call aloud a multiple of 5. Have children show this number by an arrow and write it in underneath. Emphasize that the first clock shows where 5 always falls.

3. Prepare a page of blank clock faces:



## OBJECTIVE

To review and reinforce counting by fives

## PACING

Level A All  
Level B All  
Level C All

## VOCABULARY

tally

## MATERIALS

pipe cleaners, beads, rings

## RELATED AIDS

BFA COMP LAB I—26.  
HMS—DM46.

## BACKGROUND

Man first wrote numbers in the tally form. It was only many years later that man had symbols to represent numbers. You may wish to refer to a library source for a simple history of numbers.

## SUGGESTIONS

**Initial Activity** Have the children thread five beads (rings, etc.) on a pipe cleaner and then twist it to close it. Have the children take out a handful of these "fives loops" and count to see who has the most. The children should be questioned to emphasize that counting by 5's is a faster way of counting.

## ACTIVITIES

1. Make a collection of groups containing 5 objects.

2. Make up a set of cards with the numbers by 5's to 100.

The cards are shuffled and five are dealt out to two players. The player with **5** begins and lays down this card. If able to, the player lays down any other cards in sequence.

If the player is unable to lay down a card, a card must be drawn from the deck and the other player now plays. The winner is the first one to get rid of all his or her cards.



## OBJECTIVE

To write the multiplication stories for multiplying by 5

## PACING

Level A All  
Level B All  
Level C All

## VOCABULARY

clown, juggle

## MATERIALS

counters, cardboard squares

## RELATED AIDS

BFA COMP LAB I—91.

## SUGGESTIONS

**Initial Activity** Review counting by 5's. Have the children put down 4 squares and place 5 counters on each (one on each corner and one in the middle). Have them count to find out how many counters in all. Ask them how many times they counted 5 to get 20.

Reinforce the fact that counting by 5's helps them to know the multiplication stories for 5.

## ACTIVITIES

1. Make up several square cards with patterns of 5 on each. The child chooses several cards and writes the corresponding multiplication stories.

2. Use "The Multiplication Game" in the Activity Reservoir. Modify to match the skills in this section.

3. Play "Silent Bingo" as outlined on page 165, modified for the 5 times multiplication table.

4. Use the "five loops" from the Initial Activity on page 167. Place these in a box and have the children take out a "handful of fives". Have the children record using a multiplication story.

## Multiplying by 5



1 clown can juggle 5 balls.

$$1 \times 5 = 5$$

2 clowns can juggle 10 balls.

$$2 \times 5 = 10$$

3 clowns can juggle 15 balls.

$$3 \times 5 = 15$$

4 clowns can juggle 20 balls.

$$4 \times 5 = 20$$

5 clowns can juggle 25 balls.

$$5 \times 5 = 25$$

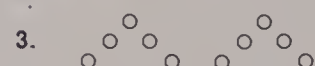
Now write multiplication stories for these.



$$3 \times 5 = 15$$



$$4 \times 5 = 20$$



$$2 \times 5 = 10$$



$$5 \times 5 = 25$$

Copy and complete.

5.  $2 \times 5 = \blacksquare 10$  6.  $4 \times 3 = \blacksquare 12$  7.  $5 \times 5 = \blacksquare 25$  8.  $5 \times 3 = \blacksquare 15$

9.  $3 \times 5 = \blacksquare 15$  10.  $2 \times 3 = \blacksquare 6$  11.  $1 \times 5 = \blacksquare 5$  12.  $3 \times 5 = \blacksquare 15$

13.  $4 \times 5 = \blacksquare 20$  14.  $4 \times 2 = \blacksquare 8$  15.  $3 \times 4 = \blacksquare 12$  16.  $4 \times 3 = \blacksquare 12$

168 Multiplying by 5

**Using the Book** Have children observe the artwork at top of page.

Ask, "How many balls can 1 clown juggle? (5)"

"How many balls can 2 clowns juggle? (10)"

"How many balls can 3 clowns juggle? (15)"

"How many balls can 4 clowns juggle? (20)"

"How many balls can 5 clowns juggle? (25)"

"What are the multiplication stories we write for these?"

1 clown can juggle 5 balls.  $1 \times 5 = 5$

2 clowns can juggle 10 balls.  $2 \times 5 = 10$

3 clowns can juggle 15 balls.  $3 \times 5 = 15$

4 clowns can juggle 20 balls.  $4 \times 5 = 20$

5 clowns can juggle 25 balls.  $5 \times 5 = 25$

Assign seatwork. Tell children to give multiplication stories for each picture. Children may verify Exercises 1 and 2 in the back of the book. Have children copy multiplication stories into books and fill in each  $\blacksquare$ . Counters should be provided for those needing them.


# Arrays for 5

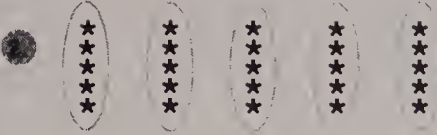



How many groups?  
How many in each group?  
How many altogether?


$$4 \times 5 = \blacksquare 20$$

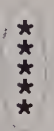
Write the number sentences.

●   $3 \times 5 = 15$

●   $5 \times 5 = 25$

3.   $2 \times 5 = 10$

4.   $4 \times 5 = 20$

5.   $1 \times 5 = 5$

Copy and complete.

- $4 \times 5 = \blacksquare 20$  7.  $1 \times 5 = \blacksquare 5$  8.  $2 \times 5 = \blacksquare 10$  9.  $3 \times 3 = \blacksquare 9$
10.  $4 \times 4 = \blacksquare 16$  11.  $4 \times 2 = \blacksquare 8$  12.  $5 \times 5 = \blacksquare 25$  13.  $5 \times 2 = \blacksquare 10$
14.  $2 \times 3 = \blacksquare 6$  15.  $5 \times 3 = \blacksquare 15$  16.  $1 \times 5 = \blacksquare 5$  17.  $2 \times 4 = \blacksquare 8$
18.  $3 \times 4 = \blacksquare 12$  19.  $2 \times 5 = \blacksquare 10$  20.  $3 \times 5 = \blacksquare 15$  21.  $4 \times 4 = \blacksquare 16$
22.  $4 \times 2 = \blacksquare 8$  23.  $4 \times 5 = \blacksquare 20$  24.  $2 \times 1 = \blacksquare 2$  25.  $5 \times 5 = \blacksquare 25$

Multiplying by 2, 3, 4, and 5 169

**Using the Book** In observing the artwork at top of the page, question children as to: "How many groups are there? (4)" "How many stars in each group? (5)" "How many stars are there in all? (20)" "What multiplication story can we write for this array? ( $4 \times 5 = 20$ )"

Assign page having children give number sentences (multiplication stories) for Exercises 1-5. Children can verify answers for Exercises 1 and 2 in the back of the book.

Children should copy the number sentences in Exercises 6-25 into their workbooks filling in each  $\blacksquare$ . Exercise 6 can be verified in the back of the book. Children should be provided with counters if needed.

## OBJECTIVE

To multiply by 5

## PACING

Level A 1-17

Level B All

Level C 3-25

## RELATED AIDS

HMS—DM47.

## SUGGESTIONS

**Initial Activity** Use counters to reinforce the idea of an array. Record the array pictorially and then numerically.

*Example*



3 rows.

5 in each row.

3 groups of 5 = 15.

$3 \times 5 = 15$

## ACTIVITIES

1. Add to the set of cards showing arrays for 2, 3, 4, and 5. The children choose an array card and write the corresponding multiplication story.

*Example*



2 rows.

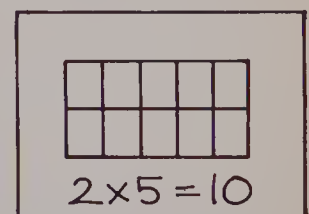
5 in each row.

2 groups of 5.

$2 \times 5 = 10$

2. Cut arrays from graph paper and paste them into a "Book of Arrays". Record the multiplication story under the graph-paper array.

*Example*



Gummed squares could be used instead of graph paper.

3. Use "The Facts Machine" game in the Activity Reservoir. Modify to match the skills in this section.



## OBJECTIVE

To write the multiplication stories for multiplying by 1

## PACING

Level A 1-14  
Level B All  
Level C 7-22

## VOCABULARY

seals, balance

## MATERIALS

counters

## SUGGESTIONS

**Initial Activity** Set up several examples as follows and have the children finish the numerical recording.

- ★ 3 rows.  
1 in each row.
- ★ 3 groups of 1 = 3.
- ★  $3 \times 1 = 3$

- ★★★ 1 row.  
3 in each row.
- 1 group of 3 = 3.
- $1 \times 3 = 3$

Repeat for 2, 4, and 5.

Emphasize that when you multiply by 1, the product is always the same as the other factor.

## ACTIVITIES

1. Have the children work in pairs. Each pair of children has a grid provided and a counter with "1" on it. (1) One child tosses the counter onto the grid. The other child must write the multiplication story when multiplying by 1.

*Example*

|   |   |   |
|---|---|---|
| 2 | 5 | 8 |
| 7 | 4 | 3 |
| 9 | 6 | 1 |

$$4 \times 1 = 4$$

The children take turns.

2. On a prepared card have children do missing factor work.

*Example*

$$\blacksquare \times 1 = 3$$

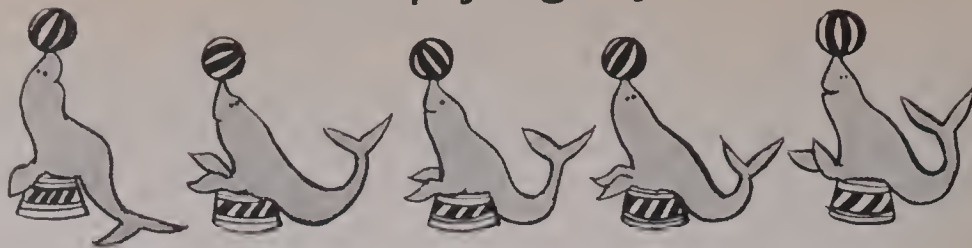
$$1 \times \blacksquare = 5$$

$$10 \times \blacksquare = 10$$

3. Problem of the week.

Set up a number code to match the letters of the alphabet.  
a = 1, b = 2, etc.

## Multiplying by 1



|                          |                  |
|--------------------------|------------------|
| 1 seal balances 1 ball.  | $1 \times 1 = 1$ |
| 2 seals balance 2 balls. | $2 \times 1 = 2$ |
| 3 seals balance 3 balls. | $3 \times 1 = 3$ |
| 4 seals balance 4 balls. | $4 \times 1 = 4$ |
| 5 seals balance 5 balls. | $5 \times 1 = 5$ |

Write multiplication stories for these.

1.  $2 \times 1 = 2$
2.  $5 \times 1 = 5$
3.  $7 \times 1 = 7$
4.  $9 \times 1 = 9$
5.  $4 \times 1 = 4$
6.  $10 \times 1 = 10$
7.  $4 \times 1 = \blacksquare 4$
8.  $7 \times 1 = \blacksquare 7$
9.  $9 \times 1 = \blacksquare 9$
10.  $5 \times 1 = \blacksquare 5$
11.  $6 \times 1 = \blacksquare 6$
12.  $3 \times 1 = \blacksquare 3$
13.  $8 \times 1 = \blacksquare 8$
14.  $2 \times 1 = \blacksquare 2$
15.  $2 \times 1 = \blacksquare 2$
16.  $9 \times 1 = \blacksquare 9$
17.  $1 \times 1 = \blacksquare 1$
18.  $6 \times 1 = \blacksquare 6$
19.  $5 \times 1 = \blacksquare 5$
20.  $8 \times 1 = \blacksquare 8$
21.  $3 \times 1 = \blacksquare 3$
22.  $4 \times 1 = \blacksquare 4$

170 Multiplying by 1

**Using the Book** Draw attention to artwork at top of the page. Remind them again of the fact: "When you multiply by 1, the product is always the same as the other factor."

Ask, "If 1 seal is balancing 1 ball, how many balls are balanced? (1)"

"What multiplication story can be written? ( $1 \times 1 = 1$ )"

"If 2 seals are each balancing 1 ball, how many balls are balanced? (2)"

"What multiplication story can be written? ( $2 \times 1 = 2$ )"

Repeat for:

3 seals (3)  $3 \times 1 = 3$ ;

4 seals (4)  $4 \times 1 = 4$ ; and

5 seals (5)  $5 \times 1 = 5$ .

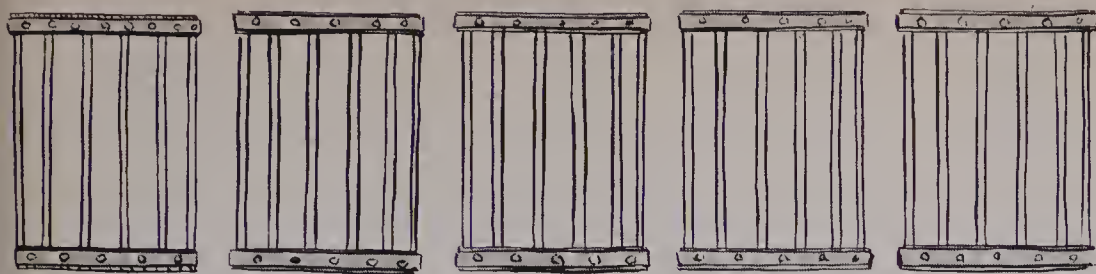
Assign page which reinforces multiplication by 1. Have children fill in blanks  $\blacksquare \times \blacksquare = \blacksquare$ . Exercises 1 and 2 may be verified in the back of the book.

For Exercises 7-22, children should copy equations in their workbooks and fill in each  $\blacksquare$ .

Write the names of different pupils in number code each week, and see if the children can write the names of the mystery pupils. The code can be varied to use different values and patterns.



# "Zero" in Multiplication



How many cages?

How many animals in each cage?

How many animals altogether?

$$5 \times 0 = 0$$

When you multiply a number by zero, the answer is zero.

Multiply these.

1.  $2 \times 0 = \blacksquare 0$
2.  $9 \times 0 = \blacksquare 0$
3.  $7 \times 0 = \blacksquare 0$
4.  $96 \times 0 = \blacksquare 0$
5.  $4 \times 0 = \blacksquare 0$
6.  $6 \times 0 = \blacksquare 0$
7.  $10 \times 0 = \blacksquare 0$
8.  $42 \times 0 = \blacksquare 0$
9.  $1 \times 0 = \blacksquare 0$
10.  $10 \times 0 = \blacksquare 0$
11.  $9 \times 0 = \blacksquare 0$
12.  $37 \times 0 = \blacksquare 0$
13.  $6 \times 0 = \blacksquare 0$
14.  $12 \times 0 = \blacksquare 0$
15.  $3 \times 0 = \blacksquare 0$
16.  $100 \times 0 = \blacksquare 0$
17.  $5 \times 0 = \blacksquare 0$
18.  $17 \times 0 = \blacksquare 0$
19.  $11 \times 0 = \blacksquare 0$
20.  $65 \times 0 = \blacksquare 0$
21.  $10 \times 0 = \blacksquare 0$
22.  $15 \times 0 = \blacksquare 0$
23.  $0 \times 0 = \blacksquare 0$
24.  $24 \times 0 = \blacksquare 0$

Multiplying by 0 171

**Using the Book** Have children observe the picture at top of the page. Ask, "How many cages are there? (5)" "How many animals do you see in each cage? (0)" "How many animals are there in all? (0)" "What multiplication story can we write to show that? ( $5 \times 0 = 0$ )"

Copy: "When you multiply a number by zero the answer is zero." on a separate strip of paper, and post as a rule for multiplication.

Have children copy questions into their workbooks filling in each  $\blacksquare$ . They may verify Exercises 1 and 2 in the back of the book.

## OBJECTIVE

To introduce multiplying by zero

## PACING

Level A All  
Level B All  
Level C 9-24

## VOCABULARY

zero

## MATERIALS

boxes

## RELATED AIDS

BFA COMP LAB I—87.

## SUGGESTIONS

**Initial Activity** Set up a situation similar to that at the top of page 171 using the boxes.

*Example*



4 boxes.

No counters in each box.

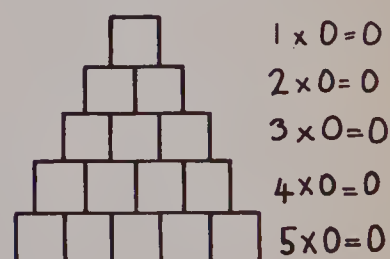
$$4 \text{ groups of } 0 = 0.$$

$$4 \times 0 = 0$$

Do several examples to establish that when you multiply a number by zero, the answer is zero.

## ACTIVITIES

1. Have the children record multiplication facts for zero beside a picture of boxes. Establish the fact that the boxes are empty.



2. Use "The Multiplication Game" from the Activity Reservoir. (Modify to match the skills in this section.)

3. Use the "Patchwork Quilt" game from the Activity Reservoir. (Skills should be modified to match this section.)

## OBJECTIVE

To provide practice in multiplication

## PACING

Level A All

Level B All

Level C Odd-numbered exercises

## RELATED AIDS

HMS—DM48.

## SUGGESTIONS

**Initial Activity** Show examples of familiar arrays on the chalkboard.

*Example*



Ask children what multiplication story can be written for this.

$$2 \times 3 = 6$$

*Tell* children that the multiplication story can be written in an up-and-down story also.

$$\begin{array}{r} 3 \\ \times 2 \\ \hline 6 \end{array}$$

Do several examples with children before assigning seatwork.

## ACTIVITIES

1. Have children work in pairs using the set of array cards from Activity 1, page 169.

2. Prepare 20 cards, 10 of which show horizontal multiplication facts and the other 10 showing the matching facts horizontally. Use these to play Concentration, the general rules for which are in Activity 3, page 129.

3. Make a set of cards using multiplication facts and  $\boxed{\geq}$  or  $\boxed{<}$ .

|  |  |
|--|--|
| $\begin{array}{r} 2 \\ \times 1 \\ \hline \end{array}$ | $\begin{array}{r} 3 \\ \times 0 \\ \hline \end{array}$ |
|--|--|

## EXTRA PRACTICE

Multiply.

$$\begin{array}{r} 1. \quad 4 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 2. \quad 2 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 3. \quad 1 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 4. \quad 0 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 5. \quad 5 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 6. \quad 2 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 7. \quad 4 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 8. \quad 3 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 9. \quad 1 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 10. \quad 5 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 11. \quad 4 \\ \times 1 \\ \hline \end{array}$$

$$\begin{array}{r} 12. \quad 3 \\ \times 2 \\ \hline \end{array}$$

## Up-and-Down Stories

We can write an up-and-down multiplication story like this.

★  
★  
★

★  
★  
★

★  
★  
★

★  
★  
★

$$\begin{array}{r} 3 \\ \times 4 \\ \hline 12 \end{array}$$

Do these.

1.  $1 \times 1 = \blacksquare 1$  2.  $2 \times 3 = \blacksquare 6$  3.  $0 \times 4 = \blacksquare 0$  4.  $15 \times 1 = \blacksquare 15$

5.  $2 \times 2 = \blacksquare 4$  6.  $5 \times 4 = \blacksquare 20$  7.  $3 \times 1 = \blacksquare 3$  8.  $4 \times 2 = \blacksquare 8$

9.  $4 \times 3 = \blacksquare 12$  10.  $5 \times 5 = \blacksquare 25$  11.  $0 \times 7 = \blacksquare 0$  12.  $17 \times 0 = \blacksquare 0$

13.  $4 \times 4 = \blacksquare 16$  14.  $3 \times 3 = \blacksquare 9$  15.  $1 \times 8 = \blacksquare 8$  16.  $9 \times 1 = \blacksquare 9$

17.  $2 \times 8 = \blacksquare 16$  18.  $5 \times 3 = \blacksquare 15$  19.  $2 \times 6 = \blacksquare 12$  20.  $47 \times 0 = \blacksquare 0$

Now do these "up-and-down" stories.

$$\begin{array}{r} 21. \quad 2 \\ \times 4 \\ \hline 8 \end{array}$$

$$\begin{array}{r} 22. \quad 3 \\ \times 1 \\ \hline 3 \end{array}$$

$$\begin{array}{r} 23. \quad 3 \\ \times 4 \\ \hline 12 \end{array}$$

$$\begin{array}{r} 24. \quad 5 \\ \times 5 \\ \hline 25 \end{array}$$

$$\begin{array}{r} 25. \quad 1 \\ \times 4 \\ \hline 4 \end{array}$$

$$\begin{array}{r} 26. \quad 6 \\ \times 0 \\ \hline 0 \end{array}$$

$$\begin{array}{r} 27. \quad 6 \\ \times 2 \\ \hline 12 \end{array}$$

$$\begin{array}{r} 28. \quad 3 \\ \times 3 \\ \hline 9 \end{array}$$

$$\begin{array}{r} 29. \quad 3 \\ \times 2 \\ \hline 6 \end{array}$$

$$\begin{array}{r} 30. \quad 1 \\ \times 5 \\ \hline 5 \end{array}$$

$$\begin{array}{r} 31. \quad 4 \\ \times 4 \\ \hline 16 \end{array}$$

$$\begin{array}{r} 32. \quad 5 \\ \times 2 \\ \hline 10 \end{array}$$

$$\begin{array}{r} 33. \quad 5 \\ \times 0 \\ \hline 0 \end{array}$$

$$\begin{array}{r} 34. \quad 5 \\ \times 4 \\ \hline 20 \end{array}$$

$$\begin{array}{r} 35. \quad 5 \\ \times 3 \\ \hline 15 \end{array}$$

172 Practice

**Using the Book** The children should work independently on these questions. If any children should experience unusual difficulty with this page, you may want to set up remedial work based on the type of questions found on this page.

# Arrays

Look at the array on this card.

|   |   |   |
|---|---|---|
| 0 | 0 | 0 |
| 0 | 0 | 0 |
| 0 | 0 | 0 |
| 0 | 0 | 0 |

4 rows.

3 in each row.

$$4 \times 3 = 12$$

Now turn the card on its side.

|   |   |   |   |
|---|---|---|---|
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |

3 rows.

4 in each row.

$$3 \times 4 = 12$$

Both = 12.

So  $4 \times 3 = 3 \times 4$ .

Write the stories that go with these arrays.

1. 

|   |   |   |
|---|---|---|
| 0 | 0 | 0 |
| 0 | 0 | 0 |

 $2 \times 3 = 6$   
 $3 \times 2 = 6$   
 $2 \times 3 = 3 \times 2$

2. 

|   |   |   |   |   |   |
|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 |
|---|---|---|---|---|---|

3. 

|   |   |   |   |   |
|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |

4. 

|   |   |   |   |   |
|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |

5. 

|   |   |   |
|---|---|---|
| 0 | 0 | 0 |
| 0 | 0 | 0 |
| 0 | 0 | 0 |
| 0 | 0 | 0 |
| 0 | 0 | 0 |
| 0 | 0 | 0 |

6. 

|   |   |   |   |
|---|---|---|---|
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |

7. 

|   |   |   |   |
|---|---|---|---|
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |

8. 

|   |   |   |   |
|---|---|---|---|
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |

9. 

|   |   |   |   |   |
|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |

Commutative property in multiplication 173

**Using the Book** Draw the children's attention to the array at top of the page on left-hand side. Ask, "How many rows do you see? (4)" "How many 0's in each row? (3)" "How many 0's altogether? (12)" "What multiplication story can we write to go with this? ( $4 \times 3 = 12$ )"

Now look at the array on right-hand side of page. Ask, "How many rows do you see? (3)" "How many 0's in each row? (4)" "How many 0's altogether? (12)" "What multiplication story can we write to go with this? ( $3 \times 4 = 12$ )"

Ask, "What is the product in each multiplication story? (12)"

Ask, "Because 12 is the answer for both, what can we say about  $4 \times 3$  and  $3 \times 4$ ? (They are the same or equal.  $4 \times 3 = 3 \times 4$ )"

When assigning the page note for Exercise 1 that

$$\begin{aligned} 2 \times 3 &= 6 \\ 3 \times 2 &= 6 \\ 2 \times 3 &= 3 \times 2. \end{aligned}$$

Assign Exercises 2-9 for independent work having children write down stories in the same format as Exercise 1.

## Answers:

2.  $1 \times 6 = 6$   
 $6 \times 1 = 6$   
 $1 \times 6 = 6 \times 1$

3.  $2 \times 5 = 10$   
 $5 \times 2 = 10$   
 $2 \times 5 = 5 \times 2$

4.  $4 \times 5 = 20$   
 $5 \times 4 = 20$   
 $4 \times 5 = 5 \times 4$

5.  $5 \times 3 = 15$   
 $3 \times 5 = 15$   
 $5 \times 3 = 3 \times 5$

6.  $4 \times 4 = 16$   
 $4 \times 4 = 16$   
 $4 \times 4 = 4 \times 4$

7.  $2 \times 4 = 8$   
 $4 \times 2 = 8$   
 $2 \times 4 = 4 \times 2$

8.  $3 \times 4 = 12$   
 $4 \times 3 = 12$   
 $3 \times 4 = 4 \times 3$

9.  $5 \times 5 = 25$   
 $5 \times 5 = 25$   
 $5 \times 5 = 5 \times 5$

## OBJECTIVE

To introduce and reinforce the commutative property in multiplication

## MATERIALS

array cards

## RELATED AIDS

HMS—DM49.

## BACKGROUND

Both arrangements of the array card on page 173 name the number of objects in the same set; therefore, they name the same number:  $4 \times 3 = 3 \times 4$ .

## SUGGESTIONS

**Initial Activity** Use an array card similar to that at the top of page 173. Show how two different multiplication stories can be seen — turn the card. Record the multiplication stories.

## ACTIVITIES

1. **Wallpaper Multiplication** Cut out array patterns from wallpaper samples having obvious arrays. The children could put these in a booklet and write both multiplication stories to illustrate the commutative property.

2. Have children prepare array cards for a work table. Also have them prepare two multiplication stories for each card. Scatter the cards and stories on table and have other children match.

3. Prepare a deck of 30 or so matching cards such as:

$$3 \times 5$$

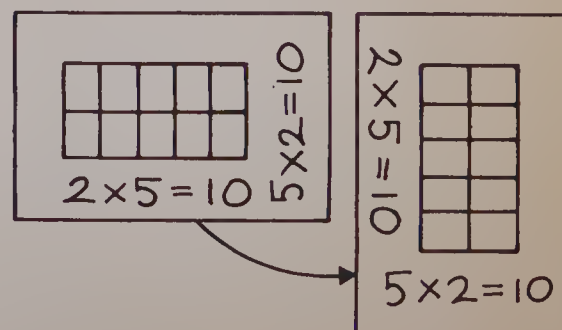
$$5 \times 3$$

Use these to play Snap.

4. Extend activities on "Book of Arrays" (page 169) by cutting out arrays from graph paper, pasting them onto a page in the array book, and writing two multiplication stories.

Note: If the array is turned on its side, the other multiplication story may be seen more easily.

Example





## OBJECTIVE

To solve problems using multiplication

## PACING

Level A 1-4

Level B All

Level C 1-6

## VOCABULARY

mysteries

## MATERIALS

variety of small concrete materials suitable for use with overhead projector such as centimetre cubes, bingo chips, pennies

## RELATED AIDS

HMS—DM50.

## SUGGESTIONS

**Initial Activity** Do several examples similar to the "mysteries" on page 174. Use the overhead projector and concrete materials to make arrays that illustrate the situation.

Be sure to demonstrate how to record the solution to the problem as an introduction to the text page.

## ACTIVITIES

1. Have the children draw an array and make a "mystery" to go with it. Display these and have the children solve each other's mystery arrays.

2. Ask the child what is missing in Exercise 6. Then have them provide suitable additional information to complete Exercise 6.

3. Prepare a number of riddle cards such as:

When you multiply me by 5, our product is 15.  
Who am I?

## Multiplication Mysteries

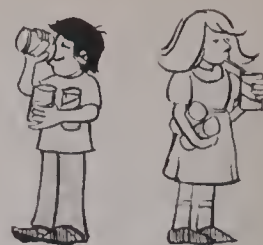
These are some mysteries that happened at the circus.

Find the answers.

Draw pictures or arrays to help you.

1. Two children drank 3 cans of pop each.  
How many cans of pop did they drink altogether?

$$2 \times 3 = \blacksquare 6$$



2. Five elephants ate 2 peanuts each.  
How many peanuts did they eat altogether?

10

3. One camel has 4 legs.  
How many legs do 5 camels have altogether?

20

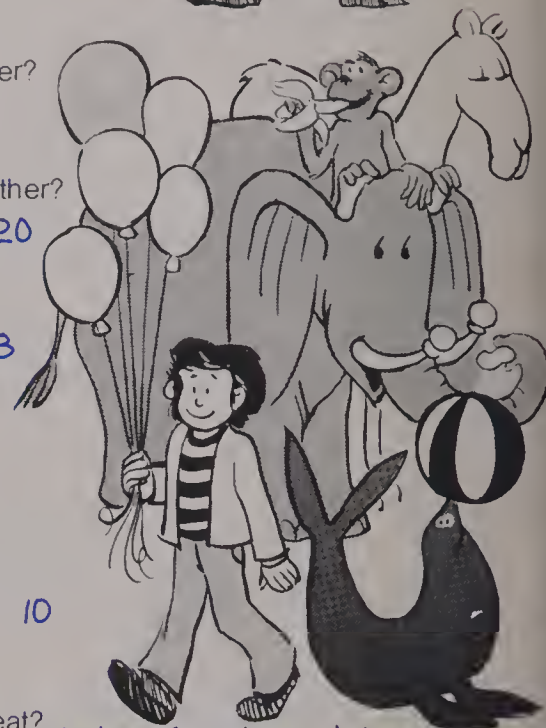
4. A seal can balance 1 ball.  
How many balls can 8 seals balance?

8

Watch these!

- ★ 5. Tom bought 5 balloons.  
So did David and Mary.  
How many balloons did the boys buy? 10
- ★ 6. A monkey can eat 5 bananas.  
How many bananas can the monkeys eat?

Number of monkeys not known.



174 Word problems

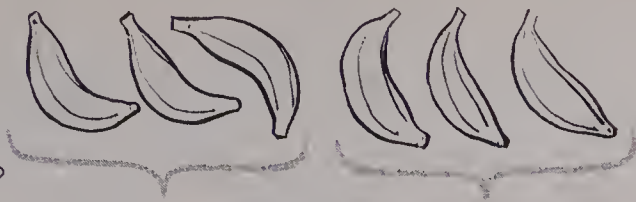
**Using the Book** Assign page. Children should give the appropriate multiplication story for each mystery from the information contained in each problem.

For Exercise 5, *remind* children to read *carefully* all information contained in problem and answer specifically stated question.

For Exercise 6, have children answer why problem is difficult to answer — what further information is needed?

# What is Division?

The animal keeper has 6 bananas for the monkeys.  
Each monkey will get 3 bananas.  
How many monkeys is he going to feed?



How many bananas?  
How many groups of 3 bananas?  
How many monkeys will get bananas?

6 shared in groups of 3.

$$6 \div 3 = 2$$



Find the number of groups.



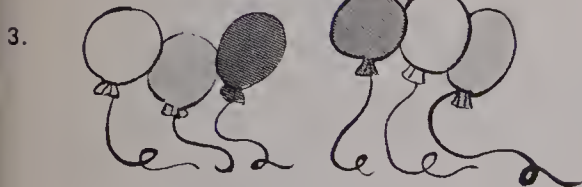
4 shared in groups of 2.

$$4 \div 2 = \blacksquare 2$$



8 shared in groups of 4.

$$8 \div 4 = \blacksquare 2$$



6 shared in groups of 3.

$$6 \div 3 = \blacksquare 2$$



6 shared in groups of 2.

$$6 \div 2 = \blacksquare 3$$

Meaning of division 175

**Using the Book** Note the display at the top of the page. Ask, "How many bananas does the animal keeper have? (6)" "How many bananas will each monkey get? (3)" "How many monkeys will be fed? (2)" "If 6 is shared in groups of 3, how many monkeys will get bananas? (2)" "What division story can we write? ( $6 \div 3 = 2$ )"

In assigning the page, be sure the children are certain what is meant by "find the number of groups."

## OBJECTIVE

To introduce the meaning of division

## PACING

Level A All  
Level B All  
Level C All

## VOCABULARY

division

## MATERIALS

counters

## SUGGESTIONS

**Initial Activity** Allow ample time for handling concrete materials to develop concept of "sharing" in division.

Use concrete materials to demonstrate initially the "sharing" aspect of division. Bring out the idea of the number of groups of a certain number in a total number.

*Example*



Groups of 2 in 6. (Six shared in groups of two.)

$$6 \div 2 = 3$$

## ACTIVITIES

1. Have the children work in pairs and set "sharing" problems for each other similar to the following.



Groups of 4 in 8. (Eight shared in groups of four.)

$$8 \div 4 = 2$$

2. Make a set of Activity Cards each showing a number of identical items (20 bananas). On each card is a question: ("How many monkeys can get 4 bananas each?"). Repeat for other division facts. Other items could be peanuts and elephants, cones and squirrels, etc.

3. Prepare cards with division sentences on them, i.e.,

$$\boxed{10 \div 5 = 2}$$

Children choose a card and draw arrays to go with the card.

## OBJECTIVE

To show the relationship between multiplication and division

## PACING

Level A All  
Level B All  
Level C All

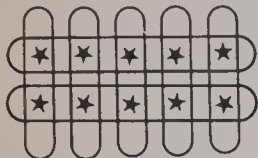
## RELATED AIDS

HMS—DM51.

## SUGGESTIONS

**Initial Activity** Use an example similar to that at the top of page 176. Emphasize the fact that division is the inverse or “undoing” of multiplication. Therefore, the children can use the multiplication facts that they know to help them with division.

*Example*



$$2 \times 5 = 10$$

$$10 \div 2 = 5$$

## ACTIVITIES

1. Have the children draw arrays and write corresponding multiplication and division stories.

2. Prepare cards with multiplication stories and other cards with corresponding division sentences. Scatter cards and have children match them.

*Example*

$$2 \times 4 = 8 \longleftrightarrow 8 \div 4 = 2$$

$$4 \times 2 = 8 \longleftrightarrow 8 \div 2 = 4$$

$$3 \times 1 = 3 \longleftrightarrow 3 \div 1 = 3$$

3. Prepare index cards with division sentences on one side such as  $15 \div 3 = \square$  and the corresponding multiplication fact on the reverse:  $5 \times 3 = 15$ . Children can use these in pairs to practise giving the quotient required for each card. The multiplication fact on the back can be used to check.

## Division and Multiplication



$$2 \times 3 = 6$$

(2 groups of 3 = 6 altogether.)

6 bananas altogether.  
3 in each group.  
2 groups of bananas.

$$6 \div 3 = 2$$

(6 altogether divided by 3 = 2.)

Write the division story that goes with these.

1.  $2 \times 2 = 4$   
 $4 \div 2 = 2$

2.  $3 \times 2 = 6$   
 $6 \div 3 = 2$

3.  $5 \times 3 = 15$   
 $15 \div 5 = 3$

4.  $4 \times 3 = 12$   
 $12 \div 4 = 3$

5.  $3 \times 3 = 9$   
 $9 \div 3 = 3$

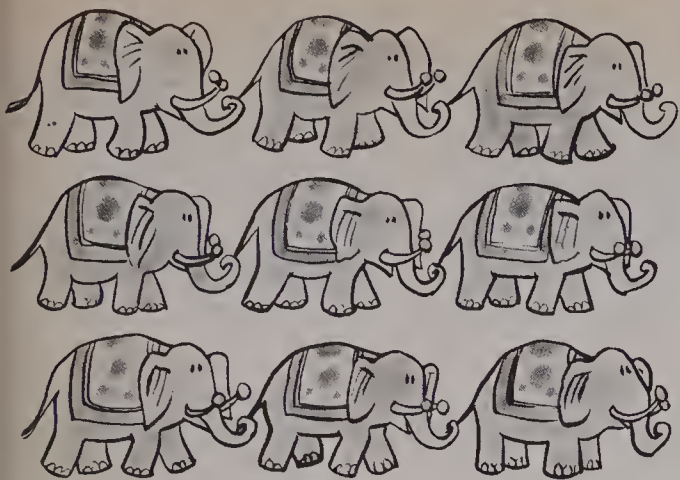
6.  $4 \times 4 = 16$   
 $16 \div 4 = 4$

**Using the Book** Have the children read or follow as you read the information in the display. Point out to them that (a) the total number of bananas remains the same (6); (b) when putting together we show it with a multiplication sentence ( $2 \times 3 = 6$ ); and (c) when sharing (“taking apart” or “dividing”) we can show it with a division sentence ( $6 \div 3 = 2$ ). Emphasize that the words in brackets in the bottom part of the display tell us how to read the number sentences.

Assign page. Have children copy the multiplication story into their workbooks and give the division story that would accompany it. Exercises 1 and 2 can be verified in the back of the book.



# Repeated Subtraction



How many elephants?  $\longrightarrow$  9  
 How many in each row?  $\longrightarrow$  3  
 How many rows?  $\longrightarrow$  3

How many times can you take away a row of elephants?

$$\begin{array}{r} 9 \\ - 3 \quad (1 \text{ row of } 3) \\ \hline 6 \\ - 3 \quad (1 \text{ row of } 3) \\ \hline 3 \\ - 3 \quad (1 \text{ row of } 3) \\ \hline 0 \end{array}$$

3 groups of 3 in 9.  
 $9 \div 3 = 3$

Copy and complete. Use repeated subtraction.

1.  $12 \div 4 = \blacksquare 3$  2.  $20 \div 5 = \blacksquare 4$  3.  $10 \div 2 = \blacksquare 5$  4.  $6 \div 2 = \blacksquare 3$   
 5.  $16 \div 2 = \blacksquare 8$  6.  $15 \div 3 = \blacksquare 5$  7.  $25 \div 5 = \blacksquare 5$  8.  $9 \div 3 = \blacksquare 3$

Repeated subtraction 177

**Using the Book** Have children observe artwork at top of the page.

Question children: "How many elephants do you see in all? (9)" "How many elephants are in each row? (3)" "How many rows are there? (3)"

Say: "If we use repeated subtraction, let's see how many times we can take away a row of elephants."

$$\begin{array}{r} 9 \text{ elephants in all} \\ - 3 \text{ (1 row of 3 elephants)} \quad (1) \\ \hline 6 \\ - 3 \text{ (1 row of 3 elephants)} \quad (2) \\ \hline 3 \\ - 3 \text{ (1 row of 3 elephants)} \quad (3) \text{ times} \\ \hline 0 \end{array}$$

"How many times were we able to take away a group of elephants? (3)" "How many groups of 3 do we have in 9? (3)" There are 3 groups of 3 in 9 or we can write that in a shorter way:

$$9 \div 3 = 3.$$

In assigning the page have the children complete the number sentences by filling in each  $\blacksquare$ . Have the number sentences answered by using repeated subtraction as well, to verify answers.

Answers for the division number sentences in Exercises 1 and 2 may be checked in the back of the book.

$$10 - \triangle = \blacksquare - \triangle = \blacksquare - \triangle = \blacksquare - \triangle = \blacksquare - \triangle = 0$$

$\triangle$  --- Always subtract same number.

## OBJECTIVE

To introduce the idea of repeated subtraction in division

## PACING

Level A All  
 Level B All  
 Level C All

## MATERIALS

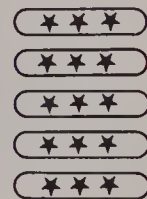
counters

## RELATED AIDS

BFA COMP LAB I—110.

## SUGGESTIONS

**Initial Activity** Set up a  $5 \times 3$  array. Review multiplication as follows.



$\underline{5}$  rows.  
 $\underline{3}$  in each row.  
 $\underline{5}$  groups of  $\underline{3} = \underline{15}$ .  
 $\underline{5} \times \underline{3} = \underline{15}$

Then show how division is related. Ask, "How many times can you take away a row of three?"

$$\begin{array}{rcl} 15 - 3 = 12 & \longrightarrow \text{★ ★ ★} & (1) \\ 12 - 3 = 9 & \longrightarrow \text{★ ★ ★} & (2) \\ 9 - 3 = 6 & \longrightarrow \text{★ ★ ★} & (3) \\ 6 - 3 = 3 & \longrightarrow \text{★ ★ ★} & (4) \\ 3 - 3 = 0 & \longrightarrow \text{★ ★ ★} & (5) \text{ times} \end{array}$$

$$5 \div 3 = 5$$

## ACTIVITIES

1. Have the children write repeated subtraction stories to go with the mittens.  
 8 mittens altogether.

$$\begin{array}{rcl} \text{☞☞} & 8 - 2 = 6 & (1) \\ \text{☞☞} & 6 - 2 = 4 & (2) \\ \text{☞☞} & 4 - 2 = 2 & (3) \\ \text{☞☞} & 2 - 2 = 0 & (4) \text{ times} \end{array}$$

$$8 \div 2 = 4$$

2. On a prepared card challenge children with this puzzle.

## OBJECTIVES

To review the division sentence  
To introduce the term "quotient"

## PACING

Level A 1-9  
Level B All  
Level C All

## RELATED AIDS

HMS—DM52.

## SUGGESTIONS

**Initial Activity** Do several examples of arrays and write down the division stories that go with each as children tell them to you.

Tell children that the answer in division stories is called the *quotient*.

## ACTIVITIES

1. Prepare cards with division stories on one half and quotients on the other half. Cut in 2 pieces. Have children match cards together.

$$\boxed{12 \div 3} \quad \boxed{= 4} \quad \boxed{6 \div 2} \quad \boxed{= 3}$$

2. Have children illustrate and answer division stories.

*Example*

8 flowers.  
2 flowers in each pot.  
We need ■ pots.  
Our division story is ■  $\div$  ■ = ■.

3. Prepare cards to review concepts taken.

$$3 \times 2 \div 3 + 10 - 4 + 2 - 3 = \rightarrow \text{Answer: } 7$$

The answer could be written on the back of the card to make this a self-checking activity.

## EXTRA PRACTICE

Divide.

- |                 |                 |
|-----------------|-----------------|
| 1. $16 \div 4$  | 2. $10 \div 5$  |
| 3. $20 \div 5$  | 4. $12 \div 2$  |
| 5. $16 \div 2$  | 6. $8 \div 4$   |
| 7. $12 \div 3$  | 8. $14 \div 2$  |
| 9. $6 \div 3$   | 10. $15 \div 5$ |
| 11. $20 \div 4$ | 12. $20 \div 2$ |

## Division Stories



6 monkeys altogether.

2 must go into each cage.

How many cages do you need for the monkeys?

$$6 \div 2 = 3$$

When you divide a number, the answer you get is called the quotient.  
In  $6 \div 2 = 3$ , the quotient is 3.

Copy and complete these.

- |                                  |                                  |                                  |
|----------------------------------|----------------------------------|----------------------------------|
| 1. $4 \div 2 = \blacksquare 2$   | 2. $10 \div 5 = \blacksquare 2$  | 3. $12 \div 4 = \blacksquare 3$  |
| 4. $20 \div 4 = \blacksquare 5$  | 5. $12 \div 3 = \blacksquare 4$  | 6. $6 \div 3 = \blacksquare 2$   |
| 7. $9 \div 3 = \blacksquare 3$   | 8. $15 \div 5 = \blacksquare 3$  | 9. $16 \div 2 = \blacksquare 8$  |
| 10. $25 \div 5 = \blacksquare 5$ | 11. $8 \div 2 = \blacksquare 4$  | 12. $20 \div 5 = \blacksquare 4$ |
| 13. $16 \div 4 = \blacksquare 4$ | 14. $18 \div 2 = \blacksquare 9$ | 15. $10 \div 2 = \blacksquare 5$ |

178 Division sentences

**Using the Book** Focus attention on the artwork at top of the page. Ask, "How many monkeys do you see in all? (6)" "How many monkeys are in each cage? (2)" "How many cages are needed for the monkeys? (3)" "What is the division story to go with this? ( $6 \div 2 = 3$ )"

Copy:

"When you divide a number, the answer you get is called the quotient. In  $6 \div 2 = 3$ , the quotient is 3."

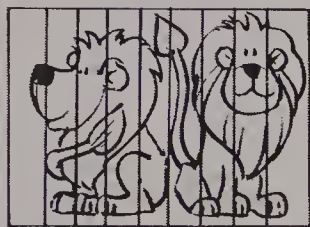
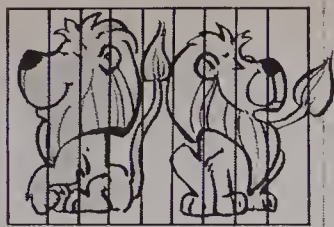
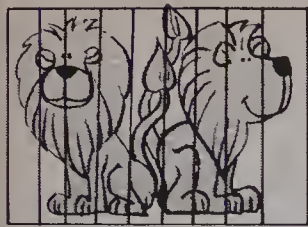
on a separate strip of paper and post as a rule for division.

Have children copy assigned work into their workbooks and fill in the quotient in each ■. Exercises 1-3 may be verified in the back of the book.



# Related Stories

Division and multiplication stories go together.



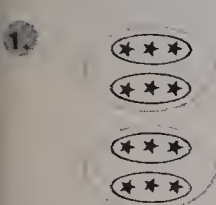
$$4 \times 2 = 8$$

$$2 \times 4 = 8$$

$$8 \div 2 = 4$$

$$8 \div 4 = 2$$

Write all the multiplication and division stories for these.



$$4 \times 3 = 12$$

$$3 \times 4 = 12$$

$$12 \div 3 = 4$$

$$12 \div 4 = 3$$

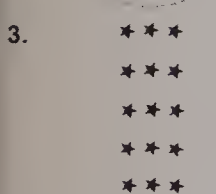


$$3 \times 4 = 12$$

$$4 \times 3 = 12$$

$$12 \div 4 = 3$$

$$12 \div 3 = 4$$

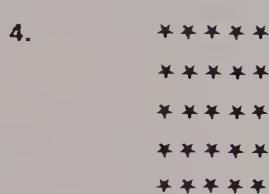


$$3 \times 5 = 15$$

$$5 \times 3 = 15$$

$$15 \div 3 = 5$$

$$15 \div 5 = 3$$



$$5 \times 5 = 25$$

$$5 \times 5 = 25$$

$$25 \div 5 = 5$$

Related sentences 179

**Using the Book** Have children observe the picture at the top of page 179. Ask, "How many lions are in each cage? (2)" "How many cages are there? (4)" "How many lions are there in all? (8)" "How many groups of 2 are shared in 8? (4)" "How many groups of 4 are shared in 8? (2)"

From the information we have:

- (1) What are 2 multiplication stories to go with this picture?

$$4 \times 2 = 8 \quad 2 \times 4 = 8$$

- (2) What are 2 related division stories to go with this picture?

$$8 \div 2 = 4 \quad 8 \div 4 = 2$$

When assigning the page, have children give the multiplication stories and related division stories for each array. Children may verify Exercises 1 and 2 in the back of the book.

## OBJECTIVE

To introduce and reinforce related sentences in multiplication and division

## PACING

Level A All

Level B All

Level C All

## VOCABULARY

related stories

## MATERIALS

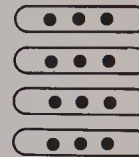
counters, overhead projector, elastics

## RELATED AIDS

HMS—DM53.

## SUGGESTIONS

**Initial Activity** Set up an array on the overhead projector similar to the following.



$$4 \times 3 = 12$$

Use elastics to isolate sets, and record the multiplication stories for the array.

*Example*



$$3 \times 4 = 12$$

Using elastics, isolate the possible division stories.

*Example*



$$12 \div 4 = 3$$



$$12 \div 3 = 4$$

Do several examples before assigning the page.



## OBJECTIVE

To introduce and reinforce related sentences in multiplication and division

## PACING

Level A 1, 2, 4, 5, 7-9

Level B All

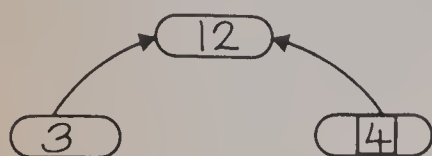
Level C All

## SUGGESTIONS

**Initial Activity** This page is an extension of the work on the previous page. Examples similar to those introducing the preceding lesson can be used (arrays, elastics, overhead projector).

## ACTIVITIES

1. "Missing Numbers" game.



Have children give the multiplication fact for each division and vice versa.

2. Prepare cards for:

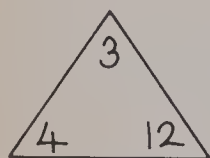
"Choose a number for the day."

*Example*

3

Have children use it in a division story and a related multiplication story.

3. Prepare cards in the shape of a triangle. Number each corner with a number from a multiplication or division story (related).



If you cover the 3 tell a division story ( $12 \div 4 = \blacksquare$ ). Child can check by uncovering.

If you cover the 12 tell a multiplication story ( $4 \times 3 = \blacksquare$  or  $3 \times 4 = \blacksquare$ ). Child checks by uncovering.

This activity can be used in *all* cases for multiplication and division facts.

4. Use the set of array cards from Activity 1, page 169. For each card the child must write 2 multiplication sentences and 2 division sentences.

*Example*

$$3 \times 4 = 12$$

$$4 \times 3 = 12$$

$$12 \div 3 = 4$$

$$12 \div 4 = 3$$

## Related Stories

Write the related multiplication stories for these.

- |   |  |  |  |
|---|--|--|--|
| (a) $8 \div 4 = 2$<br>$2 \times 4 = 8$<br>$4 \times 2 = 8$                  | (b) $15 \div 5 = \blacksquare$<br>$3 \times 5 = 15$<br>$5 \times 3 = 15$ | (c) $10 \div 2 = \blacksquare$<br>$5 \times 2 = 10$<br>$2 \times 5 = 10$ | (d) $20 \div 4 = \blacksquare$<br>$5 \times 4 = 20$<br>$4 \times 5 = 20$ |
| 2. (a) $16 \div 4 = \blacksquare$<br>$4 \times 4 = 16$                      | (b) $25 \div 5 = \blacksquare$<br>$5 \times 5 = 25$                      | (c) $12 \div 4 = \blacksquare$<br>$3 \times 4 = 12$<br>$4 \times 3 = 12$ | (d) $9 \div 3 = \blacksquare$<br>$3 \times 3 = 9$                        |
| 3. (a) $16 \div 2 = \blacksquare$<br>$8 \times 2 = 16$<br>$2 \times 8 = 16$ | (b) $6 \div 2 = \blacksquare$<br>$3 \times 2 = 6$<br>$2 \times 3 = 6$    | (c) $20 \div 5 = \blacksquare$<br>$4 \times 5 = 20$<br>$5 \times 4 = 20$ | (d) $24 \div 4 = \blacksquare$<br>$6 \times 4 = 24$<br>$4 \times 6 = 24$ |

Write the related division stories for these.

- |  |   |   |  |
|--|---|---|--|
| (a) $3 \times 4 = 12$<br>$12 \div 4 = 3$<br>$12 \div 3 = 4$              | (b) $2 \times 2 = \blacksquare$<br>$4 \div 2 = 2$                     | (c) $5 \times 3 = \blacksquare$<br>$15 \div 3 = 5$<br>$15 \div 5 = 3$ | (d) $6 \times 2 = \blacksquare$<br>$12 \div 2 = 6$<br>$12 \div 6 = 2$    |
| 5. (a) $2 \times 5 = \blacksquare$<br>$10 \div 5 = 2$<br>$10 \div 2 = 5$ | (b) $4 \times 2 = \blacksquare$<br>$8 \div 2 = 4$<br>$8 \div 4 = 2$   | (c) $6 \times 1 = \blacksquare$<br>$6 \div 1 = 6$<br>$6 \div 6 = 1$   | (d) $10 \times 2 = \blacksquare$<br>$20 \div 2 = 10$<br>$20 \div 10 = 2$ |
| 6. (a) $3 \times 3 = \blacksquare$<br>$9 \div 3 = 3$                     | (b) $5 \times 4 = \blacksquare$<br>$20 \div 4 = 5$<br>$20 \div 5 = 4$ | (c) $8 \times 2 = \blacksquare$<br>$16 \div 2 = 8$<br>$16 \div 8 = 2$ | (d) $5 \times 5 = \blacksquare$<br>$25 \div 5 = 5$                       |

Copy these and fill in the missing parts.

- |  |  |  |  |
|--|--|--|--|
| 3. $3 \times \blacksquare = 12$<br>$\blacksquare \times 3 = 12$<br>4 | 12. $12 \div \blacksquare = 3$<br>$\blacksquare \div 3 = 4$<br>12    | 8. $5 \times \blacksquare = 15$<br>$3 \times \blacksquare = 15$<br>5 | 15. $\blacksquare \div 3 = 5$<br>$15 \div \blacksquare = 3$<br>5   |
| 9. $20 \div \blacksquare = 5$<br>$20 \div \blacksquare = 4$<br>÷     | 4. $4 \times \blacksquare = 20$<br>$5 \times \blacksquare = 20$<br>× | 10. $\blacksquare \div 2 = 4$<br>$8 \div 4 = \blacksquare$<br>8      | 2. $\blacksquare \times 4 = 8$<br>$4 \times 2 = \blacksquare$<br>8 |
| 11. $2 \times 5 = \blacksquare$<br>$5 \times \blacksquare = 10$<br>2 | 10. $10 \div \blacksquare = 5$<br>$10 \div 5 = \blacksquare$<br>2    | 12. $8 \div 1 = \blacksquare$<br>$8 \div \blacksquare = 8$<br>1      | 8. $8 \times \blacksquare = 8$<br>$\blacksquare \times 1 = 8$<br>8 |

180 Related sentences

**Using the Book** Children work independently on the assigned work. They copy the number stories into their workbooks and fill in each  $\blacksquare$ .

5. Prepare a sheet of related sentences in groups of four but without operations or equal signs. Have children fill in the blanks.

*Example*

$$3 \bullet 4 \bullet 12$$

$$4 \bullet 3 \bullet 12$$

$$12 \bullet 3 \bullet 4$$

$$12 \bullet 4 \bullet 3$$

etc.

# Dividing by 1



4 fish for the seals.

1 fish for each seal.

How many seals will the clown feed?

$$4 \div 1 = 4$$

When you divide a number by 1, the answer is the same as the number you are dividing.

Divide these.

1.  $8 \div 1 = \blacksquare 8$  2.  $16 \div 1 = \blacksquare 16$  3.  $9 \div 1 = \blacksquare 9$  4.  $2 \div 1 = \blacksquare 2$   
 5.  $12 \div 1 = \blacksquare 12$  6.  $4 \div 1 = \blacksquare 4$  7.  $6 \div 1 = \blacksquare 6$  8.  $25 \div 1 = \blacksquare 25$   
 9.  $15 \div 1 = \blacksquare 15$  10.  $20 \div 1 = \blacksquare 20$  11.  $7 \div 1 = \blacksquare 7$  12.  $10 \div 1 = \blacksquare 10$

Division by 1 181

**Using the Book** Have children observe the artwork at the top of the page. Ask, "How many fish are there altogether? (4)" "How many fish does each seal get? (1)" "How many seals will be fed? (4)" "What division story can we write? ( $4 \div 1 = 4$ )"

Copy:

"When you divide a number by 1, the answer is the same as the number you are dividing."

on a separate strip of paper and post in room as a rule for dividing.

Have children copy the division stories into their workbooks and fill in the answers for each  $\blacksquare$ . Exercise 1 may be checked in the back of the book.

## OBJECTIVE

To introduce the concept of dividing by 1

## PACING

Level A All

Level B All

Level C All

## VOCABULARY

dividing

## MATERIALS

counters, boxes, margarine tubs (or other containers)

## SUGGESTIONS

**Initial Activity** Set up a situation as follows. Put down 4 boxes and place 1 counter in each.

$$4 \div 1 = 4$$

4 counters.

1 counter in each box.

4 boxes used.

Repeat using a different number of containers.

Emphasize the rule that when you divide a number by 1, the quotient is the same as the number you are dividing.

## ACTIVITIES

- (a) Have the children draw random numbers from a box.  
 (b) Divide the number by 1.  
 (c) Record the division sentence.

34  $34 \div 1 = 34$

2. Play "Patchwork Quilt" from the Activity Reservoir using the  $\div 1$  button.

3. Prepare cards for matching related multiplication and division stories.

|                  |                |
|------------------|----------------|
| $2 \times 1 = 2$ | $4 \div 1 = 4$ |
| $3 \times 1 = 3$ | $6 \div 1 = 6$ |
| $6 \times 1 = 6$ | $2 \div 1 = 2$ |
| $4 \times 1 = 4$ | $3 \div 1 = 3$ |

## OBJECTIVE

To provide practice in multiplication, division, and problem solving

## PACING

Level A 1-8

Level B 1-8

Level C All

## ACTIVITIES

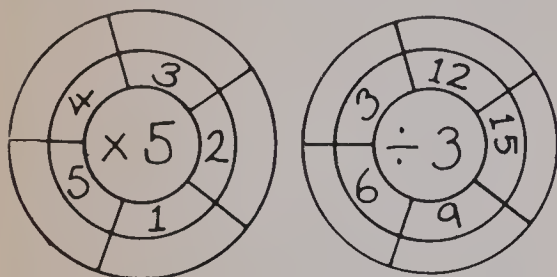
1. Use "The Multiplication Game" in the Activity Reservoir. Modify to match the skills in this section.

2. Prepare cards  $\square$ ,  $\square$ ,  $\square$ . Use with multiplication cards, as shown.

Example

$$\boxed{5 \times 2} \quad \square \quad \boxed{3 \times 4}$$

3. Prepare wheels. (See DM55 for wheel patterns.)



## EXTRA PRACTICE

Multiply.

- |                 |                  |
|-----------------|------------------|
| 1. $4 \times 2$ | 2. $5 \times 3$  |
| 3. $6 \times 1$ | 4. $3 \times 4$  |
| 5. $5 \times 2$ | 6. $4 \times 4$  |
| 7. $3 \times 1$ | 8. $2 \times 5$  |
| 9. $7 \times 2$ | 10. $8 \times 1$ |

Divide.

- |                |                 |
|----------------|-----------------|
| 1. $15 \div 3$ | 2. $16 \div 4$  |
| 3. $8 \div 1$  | 4. $10 \div 5$  |
| 5. $18 \div 2$ | 6. $12 \div 4$  |
| 7. $8 \div 2$  | 8. $9 \div 3$   |
| 9. $20 \div 5$ | 10. $15 \div 5$ |

## Practice

Multiply.

- (a)  $5 \times 3 = \blacksquare 15$  (b)  $3 \times 2 = \blacksquare 6$  (c)  $5 \times 5 = \blacksquare 25$  (d)  $4 \times 5 = \blacksquare 20$
- (a)  $2 \times 8 = \blacksquare 16$  (b)  $4 \times 4 = \blacksquare 16$  (c)  $1 \times 8 = \blacksquare 8$  (d)  $0 \times 9 = \blacksquare 0$
- (a)  $2 \times 10 = \blacksquare 20$  (b)  $3 \times 3 = \blacksquare 9$  (c)  $1 \times 14 = \blacksquare 14$  (d)  $2 \times 4 = \blacksquare 8$

Divide.

- (a)  $20 \div 4 = \blacksquare 5$  (b)  $8 \div 4 = \blacksquare 2$  (c)  $12 \div 2 = \blacksquare 6$  (d)  $15 \div 3 = \blacksquare 5$
- (a)  $6 \div 2 = \blacksquare 3$  (b)  $8 \div 2 = \blacksquare 4$  (c)  $10 \div 5 = \blacksquare 2$  (d)  $14 \div 2 = \blacksquare 7$
- (a)  $4 \div 2 = \blacksquare 2$  (b)  $12 \div 3 = \blacksquare 4$  (c)  $15 \div 5 = \blacksquare 3$  (d)  $10 \div 1 = \blacksquare 10$

7. There are 4 cages.

There are 3 monkeys in each cage.

How many monkeys are there altogether?  $12$

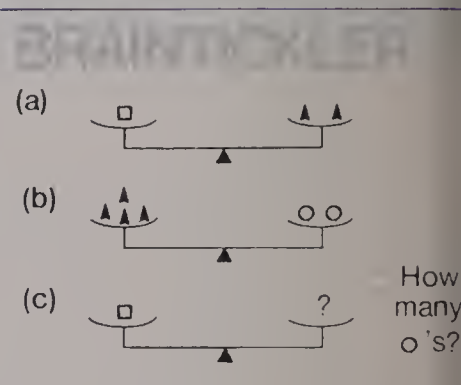
$$4 \times 3 = \blacksquare 12$$

8. One elephant has 4 legs.

How many legs do 4 elephants have?  $16$

Watch these!

- ★ 9. Each clown wears 3 hats and 1 coat. There are 9 hats altogether. *The number of coats is not known.* How many clowns are there?  $3$
- ★ 10. The children got 4 boxes of popcorn. *The number of boxes per child is not known.* How many children were there?  $4$



**Using the Book** Tell children that this page will help them to remember and use the rules they have learned so far about multiplication and division.

Children should copy the exercises into their workbooks and fill in each  $\blacksquare$ .



# Animal Trainer

1. The lion tamer has 12 lions.  
He put them into 4 cages.  
How many lions are in each cage? **3**

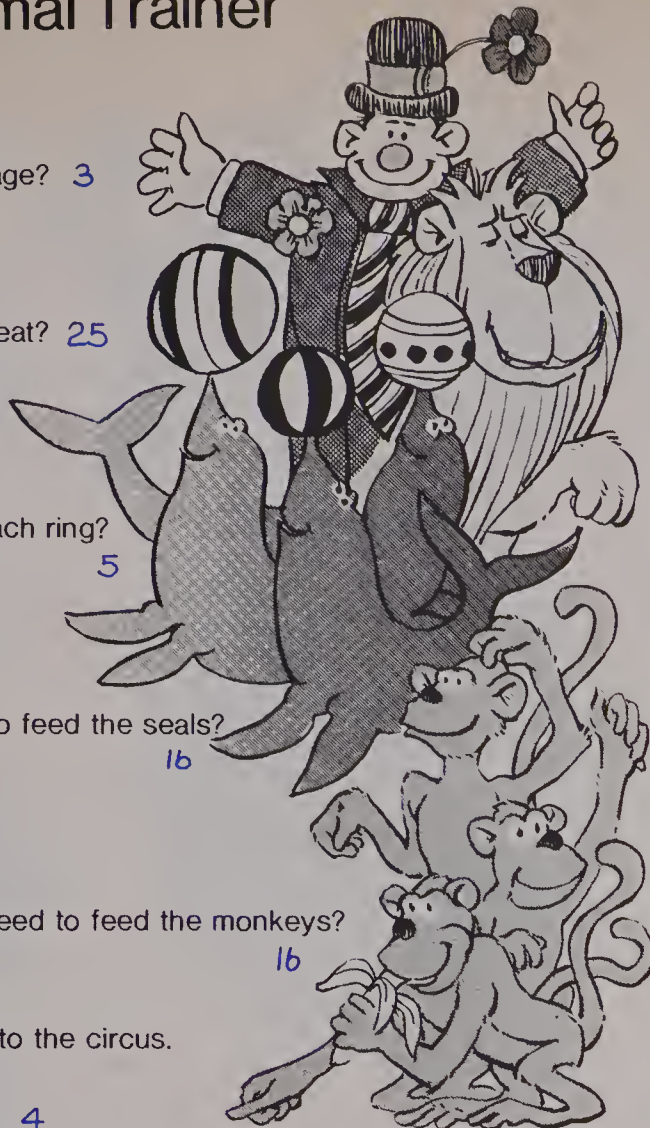
2. One lion can eat 5 steaks.  
How many steaks can 5 lions eat? **25**

3. The circus has 3 rings.  
There are 15 clowns.  
How many clowns will go in each ring? **5**

4. There are 16 seals.  
Each seal can eat 1 fish.  
How many fish do they need to feed the seals? **16**

5. There are 4 monkeys.  
Each monkey ate 4 bananas.  
How many bananas did they need to feed the monkeys? **16**

6. There were 20 children going to the circus.  
5 sat in each row.  
How many rows did they use? **4**



Mixed problems 183

**Using the Book** Children should work independently on the number stories. Again encourage use of arrays for those who need them. Exercises 1 and 2 may be checked in the back of the book by children.

## OBJECTIVE

To solve problems using multiplication and division

## PACING

Level A All  
Level B All  
Level C All

## VOCABULARY

tamer, steaks

## RELATED AIDS

HMS—DM54.

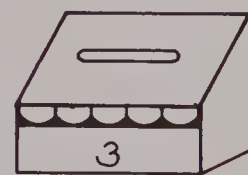
## SUGGESTIONS

**Initial Activity** Do several "mysteries" with children being sure that solutions require mixed operations. Demonstrate the steps involved in solving problems and a useful method of recording answers and results. For example: (a) read problem, (b) draw arrays, (c) write the number sentence, and (d) write a short story.

## ACTIVITIES

1. Have children write their own animal mysteries on the front of a card and work solution on back. The children use these cards with a friend. Some children or groups may benefit by having numbers supplied or problems already started for them.

2. Set up "mailboxes" for quotients 2, 3, 4, and 5. Have the children deliver mail to the proper mailbox.



$$6 \div 2 =$$

$$4 \div 1 =$$

3. The children could dramatize the role of an animal trainer and have a circus play.

This activity could enable the children to use many aspects of mathematics — shape (tent), measurement (how tall is an elephant?), and money (tickets).

## OBJECTIVE

To provide practice in multiplication and division

## PACING

Level A All  
Level B All  
Level C All

## RELATED AIDS

HMS—DM55.

## SUGGESTIONS

**Initial Activity** Use the overhead projector to do several examples for multiplication and division with children as illustrated on these two pages.

## ACTIVITIES

1. Use the "Patchwork Quilt" game in the Activity Reservoir. Modify to match the skills in this section.

2. Prepare cards drilling multiplication and division facts such as:

|                            |                             |                            |
|----------------------------|-----------------------------|----------------------------|
| $24 \div 8 = \blacksquare$ | $8 \times 1 = \blacksquare$ | $12 \div 6 = \blacksquare$ |
|----------------------------|-----------------------------|----------------------------|

(Laminate, if possible, so that answers can be written on with grease pencil and later cleaned for reuse.) On the back of each card place one letter of a short "secret message" such as "Excellent" or "Super Work". When cards are placed on a table top in order of least answer to greatest answer and turned over, message appears.

3. Prepare cards with instructions.

*Example*

1. (a) Take  $\boxed{6}$ .
- (b) Multiply by 2.
- (c) Subtract 3.
- (d) Divide by 1.
- (e) Subtract 5.
- (f) Add 8.

(Answer  $\boxed{12}$  can be put on back of card or on a separate Answer Card.)

|             |
|-------------|
| Answer Card |
| 1. 12       |

Children work together in pairs. One child gives oral instructions; other child records the answer. Partners take turns.

## EXTRA PRACTICE

Multiply.

- |                 |                 |
|-----------------|-----------------|
| 1. $4 \times 5$ | 2. $3 \times 2$ |
| 3. $3 \times 4$ | 4. $8 \times 1$ |
| 5. $4 \times 4$ | 6. $7 \times 0$ |

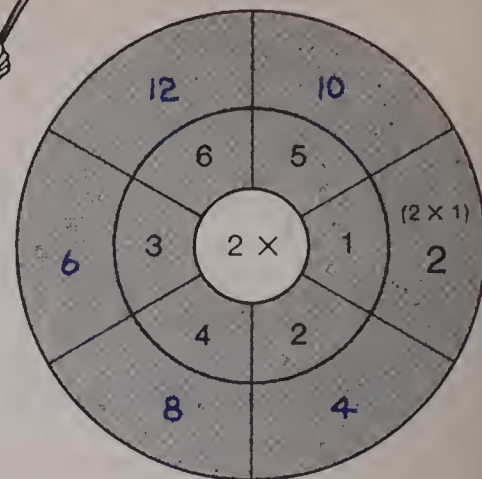
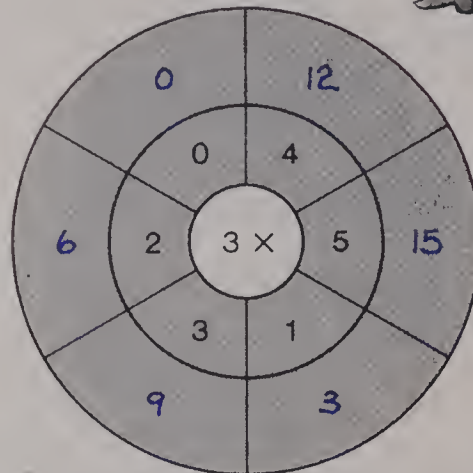
Divide.

- |                 |                  |
|-----------------|------------------|
| 7. $5 \times 5$ | 8. $1 \times 7$  |
| 9. $2 \times 4$ | 10. $5 \times 4$ |
- 
- |                |                 |
|----------------|-----------------|
| 1. $16 \div 2$ | 2. $15 \div 3$  |
| 3. $8 \div 4$  | 4. $12 \div 4$  |
| 5. $18 \div 3$ | 6. $7 \div 1$   |
| 7. $12 \div 3$ | 8. $17 \div 1$  |
| 9. $20 \div 5$ | 10. $16 \div 4$ |

## Three-ring Circus

Multiply the number in the centre by the numbers in the red (middle) ring.

Put the product in the outside ring.



Make up some more multiplication rings for 1, 5, and 0.

184 Practice

**Using the Book** Children should be provided with blank ring sheets (DM55) for these exercises. Have children copy the given information from the book onto ring sheets and then fill in the answers in the remaining spaces.

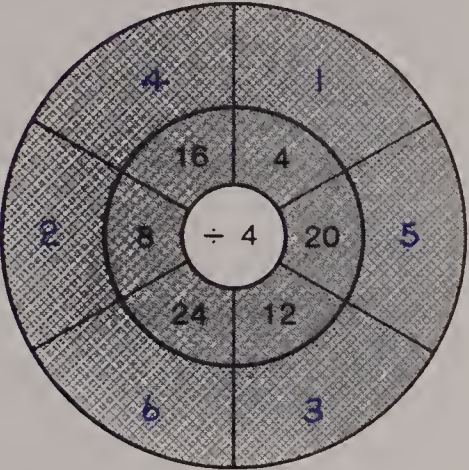
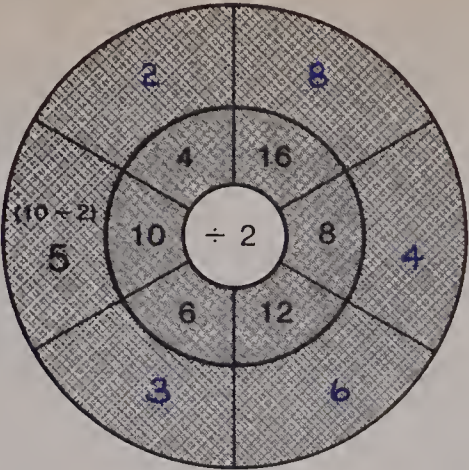
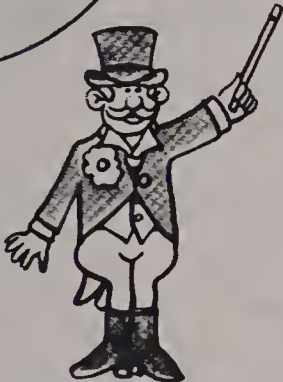


Divide the number in the middle ring (red) by the number in the centre.

Put the answer in the outside ring.



What you know about multiplying will help you.





OBJECTIVE

To evaluate achievement of the chapter objectives

PACING

- Level A All
- Level B All
- Level C All

RELATED AIDS

HMS—DM1 and DM56.

Chapter Test

Multiply.

- 1. (a)  $2 \times 10 = \blacksquare 20$  (b)  $4 \times 3 = \blacksquare 12$  (c)  $4 \times 1 = \blacksquare 4$  (d)  $5 \times 0 = \blacksquare 0$
- 2. (a)  $3 \times 3 = \blacksquare 9$  (b)  $5 \times 5 = \blacksquare 25$  (c)  $3 \times 5 = \blacksquare 15$  (d)  $5 \times 4 = \blacksquare 20$
- 3. (a)  $6 \times 0 = \blacksquare 0$  (b)  $1 \times 9 = \blacksquare 9$  (c)  $12 \times 1 = \blacksquare 12$  (d)  $1 \times 3 = \blacksquare 3$
- 4. (a)  $4 \times 5 = \blacksquare 20$  (b)  $2 \times 3 = \blacksquare 6$  (c)  $2 \times 2 = \blacksquare 4$  (d)  $9 \times 0 = \blacksquare 0$
- 5. (a)  $4 \times 4 = \blacksquare 16$  (b)  $4 \times 2 = \blacksquare 8$  (c)  $1 \times 4 = \blacksquare 4$  (d)  $3 \times 2 = \blacksquare 6$

Divide.

- 6. (a)  $15 \div 3 = \blacksquare 5$  (b)  $12 \div 4 = \blacksquare 3$  (c)  $20 \div 2 = \blacksquare 10$  (d)  $10 \div 2 = \blacksquare 5$
- 7. (a)  $9 \div 3 = \blacksquare 3$  (b)  $4 \div 2 = \blacksquare 2$  (c)  $12 \div 3 = \blacksquare 4$  (d)  $8 \div 4 = \blacksquare 2$
- 8. (a)  $6 \div 3 = \blacksquare 2$  (b)  $20 \div 4 = \blacksquare 5$  (c)  $15 \div 5 = \blacksquare 3$  (d)  $9 \div 1 = \blacksquare 9$
- 9. (a)  $12 \div 2 = \blacksquare 6$  (b)  $10 \div 5 = \blacksquare 2$  (c)  $8 \div 2 = \blacksquare 4$  (d)  $14 \div 2 = \blacksquare 7$
- 10. (a)  $16 \div 4 = \blacksquare 4$  (b)  $25 \div 5 = \blacksquare 5$  (c)  $25 \div 1 = \blacksquare 25$  (d)  $6 \div 2 = \blacksquare 3$

- 11. One clown juggles 4 balls.  
How many balls can 4 clowns juggle? **16**
- 12. There are 12 monkeys.  
Three will go into each cage.  
How many cages? **4**
- 13. One ostrich has 2 legs.  
How many legs do 10 ostriches have? **20**

**Using the Book** Each student should do this test independently under supervision. Assistance should be given only when the instructions are not understood. After the work has been corrected, you should provide appropriate remedial work. You may wish to reteach if a large number of children had difficulty with a particular topic or concept.

The following chart will help in this regard. The specific objectives are listed in the Chapter Overview (see page 156).  
An alternate Chapter Test can be found in the Holt Mathematics System Duplicating Masters available for use with this grade level.

| Test Item        | Objective | Text Page Number |
|------------------|-----------|------------------|
| 1-13             | A         | 157, 175-177     |
| 1-5              | B         | 160-168          |
| 6-10             | C         | 178-181          |
| 1(d), 3(a), 4(d) | D         | 171              |
| 11-13            | E         | 174, 183         |

# Cumulative Review

## OBJECTIVE

To review and test selected concepts and skills previously covered

1. (a) 
$$\begin{array}{r} 461 \\ + 153 \\ \hline 614 \end{array}$$
 (b) 
$$\begin{array}{r} 147 \\ + 392 \\ \hline 539 \end{array}$$
 (c) 
$$\begin{array}{r} 293 \\ + 368 \\ \hline 661 \end{array}$$
 (d) 
$$\begin{array}{r} 375 \\ + 279 \\ \hline 654 \end{array}$$
 (e) 
$$\begin{array}{r} 582 \\ + 149 \\ \hline 731 \end{array}$$
2. (a) 
$$\begin{array}{r} 184 \\ - 62 \\ \hline 122 \end{array}$$
 (b) 
$$\begin{array}{r} 398 \\ - 243 \\ \hline 155 \end{array}$$
 (c) 
$$\begin{array}{r} 576 \\ - 239 \\ \hline 337 \end{array}$$
 (d) 
$$\begin{array}{r} 465 \\ - 178 \\ \hline 287 \end{array}$$
 (e) 
$$\begin{array}{r} 907 \\ - 569 \\ \hline 338 \end{array}$$
3. (a) 
$$\begin{array}{r} 631 \\ + 105 \\ \hline 736 \end{array}$$
 (b) 
$$\begin{array}{r} 423 \\ + 289 \\ \hline 712 \end{array}$$
 (c) 
$$\begin{array}{r} 843 \\ - 305 \\ \hline 538 \end{array}$$
 (d) 
$$\begin{array}{r} 768 \\ + 178 \\ \hline 946 \end{array}$$
 (e) 
$$\begin{array}{r} 543 \\ - 164 \\ \hline 379 \end{array}$$
4. (a)  $4 \times 5 = \blacksquare 20$  (b)  $5 \times 2 = \blacksquare 10$  (c)  $1 \times 6 = \blacksquare 6$  (d)  $10 \times 2 = \blacksquare 20$
5. (a)  $8 \times 0 = \blacksquare 0$  (b)  $3 \times 5 = \blacksquare 15$  (c)  $5 \times 5 = \blacksquare 25$  (d)  $4 \times 3 = \blacksquare 12$
6. (a)  $12 \div 4 = \blacksquare 3$  (b)  $8 \div 2 = \blacksquare 4$  (c)  $9 \div 3 = \blacksquare 3$  (d)  $20 \div 4 = \blacksquare 5$
7. (a)  $10 \div 2 = \blacksquare 5$  (b)  $20 \div 5 = \blacksquare 4$  (c)  $12 \div 3 = \blacksquare 4$  (d)  $6 \div 2 = \blacksquare 3$
8. (a)  $14 \div 2 = \blacksquare 7$  (b)  $9 \times 0 = \blacksquare 0$  (c)  $25 \div 5 = \blacksquare 5$  (d)  $4 \times 2 = \blacksquare 8$
9. One clown wears 5 hats.  
How many hats can 4 clowns wear? **20**
10. There are 2 clown cars.  
16 clowns can ride.  
How many clowns ride in each car? **8**
11. There were 25 apples.  
A circus horse can eat 5 apples.  
How many circus horses will be fed? **5**
12. There were no gorillas.  
There were 6 cages.  
How many gorillas in each cage? **0**

Chapters 1 - 6: cumulative review 187

**Using the Book** This page may be used for diagnostic and remedial as well as review purposes. Children should check their work, correct any errors, and review the pages that contain any problems of the type they missed. Some children can do this on their own while others may need help. If a large number of children have a particular problem incorrect, you may want to reteach that topic to the groups, then assign a duplicated worksheet to reinforce it or refer to an appropriate skill card in the BFA Computational Skills Kit I.

| Test Item | Text Page Number |
|-----------|------------------|
| 1         | 54               |
| 2         | 67-68            |
| 3         | 76               |
| 4, 5      | 172              |
| 6-8       | 182              |
| 9-12      | 183              |

# CHAPTER 7 OVERVIEW

This chapter develops the concepts of perimeter, area, and volume. It reviews or introduces metric units of length, area, volume, capacity, mass, and temperature. It extends the concept of time dealing with the clock and calendar.

## OBJECTIVES

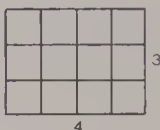
- A To calculate the perimeter, area, and volume of appropriate shapes
- B To use and read instruments for measuring capacity, mass, temperature, and time
- C To find what time it is given the minutes before (or minutes after) a given time
- D To solve problems

## BACKGROUND

The perimeter of a polygon is the sum of the lengths of its sides. The area of a polygon is the sum of the unit squares contained within its shape. The volume of a solid is the sum of the unit cubes that make up the shape. At this level the formulas for perimeter, area, and volume are not developed.

The area of a rectangle is developed by (for a  $4 \times 3$  rectangle):

number of squares in 1 row  $\longrightarrow$  1, 2, 3, 4.  
number of squares in 3 rows  $\longrightarrow$  4, 8, 12.



The volume of a rectangular solid is dealt with in a similar manner.

Note that twenty-four hour clock time notation is used (02:10, 07:30, etc.) but that all time references on these pages are directed to before, or shortly after, noon. You may wish to speak of "two thirty in the afternoon" but should not, at this level, write it as 14:30.

## MATERIALS

centimetre and metre rulers  
2 cm squares  
construction paper  
 $4 \times 4$  one centimetre dot paper  
cubes  
centimetre cubes  
containers of 100 mL, 0.5 L, 1 L, 2 L, and random sizes  
calendars

demonstration and real thermometers  
model clocks  
duplicated clock faces without hands

## CAREER AWARENESS

### Pet Shop Clerk [202, 205]

A pet shop clerk is responsible for the care and sale of pets and pet supplies. Familiarity with pets and their numerous care products is usually acquired on the job but can also be gleaned from brochures, catalogues, and books.

A clerk must be congenial, honest, and of a tidy appearance and manner. A good memory for details and prices is necessary. Customers are of all ages though the younger ones are often supervised by parents or friends.

Since pets must be taken care of on holidays and weekends, some shift work is required. Also the clerk often has to clean, feed, and water the pets.

Salaries may be of two types: straight wages or basic wages plus commission of sales.

### Bus Drivers [213]

Bus drivers transport people of all ages to their destinations safely, quickly, and courteously. Because their jobs can be stressful due to weather, road conditions, and difficult passengers, the drivers need to remain calm and steady at all times. They must be self-reliant since they work without direct supervision.

Some of their responsibilities include taking tickets, handling baggage, helping passengers on and off the bus, filling out daily trip sheets, filing reports on accidents, delays, and so on, answering questions about the schedules, routes, and transfers. They may also have to be responsible for some maintenance of their bus. This might involve checking tires, oil, fuel, windshield wipers, lights, brakes, and coolant.

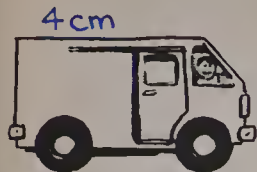
Oh, yes, they also drive the buses. They are often on shift work, working different hours of the day and weekends and holidays.



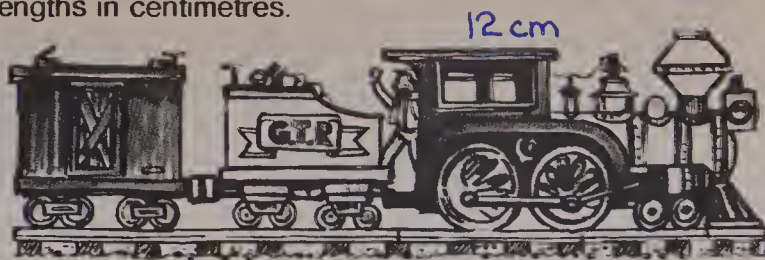
# Tune Up

Use your ruler. Write the lengths in centimetres.

1.



2.



Use your ruler. Write the lengths measured to the nearest centimetre.

3.



4.



In your workbook, draw segments

5. 6 cm long.
6. 13 cm long.
7. 9 cm long.
8. On the floor, use chalk to draw a segment 3 m long.
9. Measure to the nearest metre the length of the teacher's desk; the width of the desk.

Measurement practice 189

## OBJECTIVE

To review using a ruler to measure lengths in centimetres and in metres

## PACING

Level A All  
Level B All  
Level C All

## MATERIALS

rulers marked in centimetres, metresticks

## ACTIVITIES

1. Direct the child to make a list of items both in the classroom and outside the classroom. Ask the child to estimate and record the estimate in a separate column before actually making the measurement.

2. Organize a scavenger hunt to measure lengths of specific items or to find items of specified lengths.

*Variation:* Provide a variety of solid shapes. Children put a string around a shape, and then straighten the string out to find the perimeter.

3. Direct the children to measure 4 items in metres, decimetres, and centimetres. (Choose items that are 1, 2, 3, and 4 m long. Draw segments on the floor if necessary.) The children are to record the lengths. Ask the child what relations they see in the three measures for any one length.

**Using the Book** Use this page as a diagnostic and review exercise. While it reviews Chapter 4, the questions relate to topics in this chapter. The ability to measure the length of a segment is critical. If any children have difficulty with this skill, it is imperative they be given additional help and experiences in using a ruler.

Since Exercises 8 and 9 are activities, allow children to move about and to experience lengths measured in metres.

## OBJECTIVES

To develop the concept of perimeter  
To find perimeter by adding

## PACING

Level A 1-13  
Level B 1-13  
Level C All

## VOCABULARY

distance, perimeter

## MATERIALS

ruler marked in centimetres for each child, objects suitable for finding the perimeter

## RELATED AIDS

HMS—DM57.

## BACKGROUND

Perimeter is a concept that needs to be developed slowly from the concrete stage by actually moving around an object. The perimeter of a polygon is the distance around it; it is the sum of the lengths of all of its sides.

## SUGGESTIONS

**Initial Activity** Have the children move “around” the classroom, the gymnasium, or other large spaces. Discuss the length of a fence around a garden.

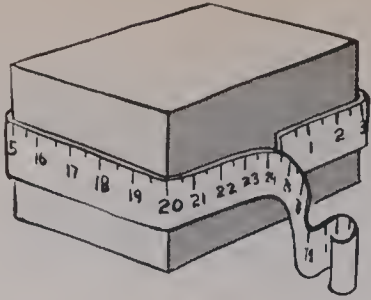
Use a large rectangular piece of cardboard (about 20 cm × 30 cm at least). Discuss and show the meaning of the distance around the cardboard by using a string. Then measure the length of the string. Repeat this using pupil desks. After some experiences of this type ask how they — the class — would find the distance “around” the cardboard or their desk if they only had a ruler. This leads to the idea that we measure each side and find the sum of the lengths.

## ACTIVITIES

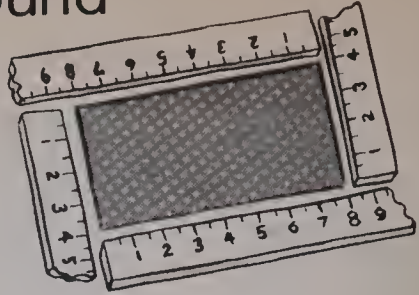
1. Provide the children with various objects to measure and find the perimeters. Each child should measure the lengths of the sides, record the lengths, then add to find the perimeter.

2. Have the children draw and cut out different-sized polygons. Label A, B, C, . . . Each child measures the sides to the nearest centimetre and calculates the perimeter.

### Going Around



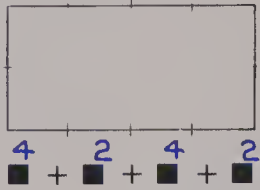
Distance around the box is 24 units.  
Perimeter is 24 units.

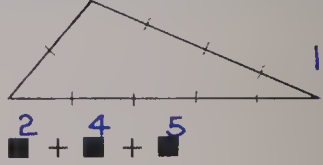


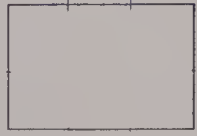
Distance around rectangle is  
8 units + 4 units + 8 units + 4 units.  
Perimeter is 24 units.

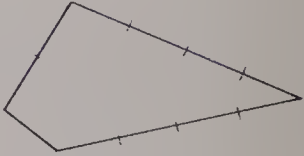
**The distance around an object is the perimeter.**

Add to find the perimeter.

1.  12 units  
 $4 + 2 + 4 + 2$

2.  11 units  
 $2 + 4 + 5$

3.  10 units  
 $4 + 3 + 4 + 3$

4.  11 units  
 $3 + 4 + 3 + 2 + 3$

1 unit.

190 Perimeter

**Using the Book** Discuss the display. After the idea of the *distance around* the object is grasped, introduce the word “perimeter” by using it but do not require children to use it at this time other than in interpreting the questions.

Ask the child what the length of each side of the rectangle is in Exercise 1. Write these on the chalkboard. Then ask the child to add these four numbers. Write: The perimeter is 12 units. Assign Exercises 2-6.

For Exercises 7-10, direct the child to use his ruler to measure each side in centimetres and then find the perimeter.

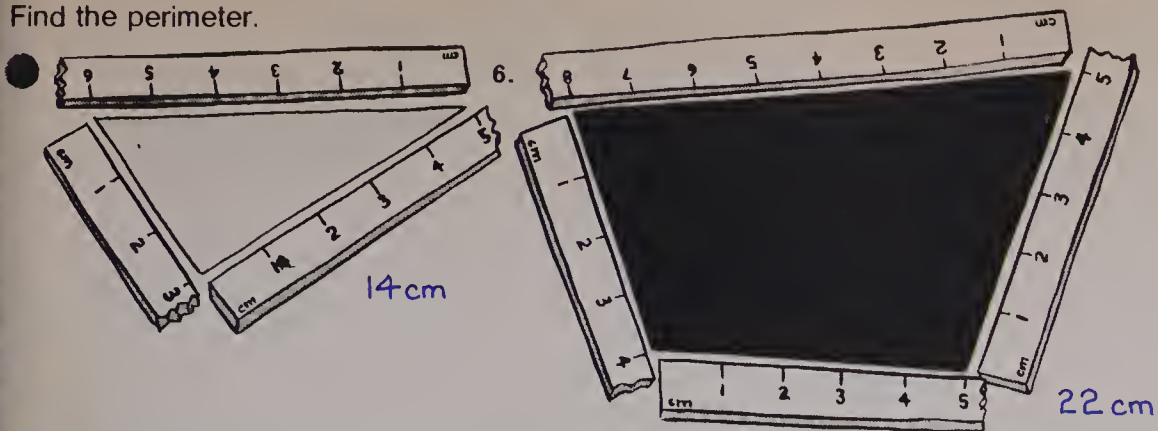
3. Provide the child with a set of 9 squares (1 cm sides). Ask the child to make various shapes and record the perimeter of each beside the diagram of each shape.

*Example*

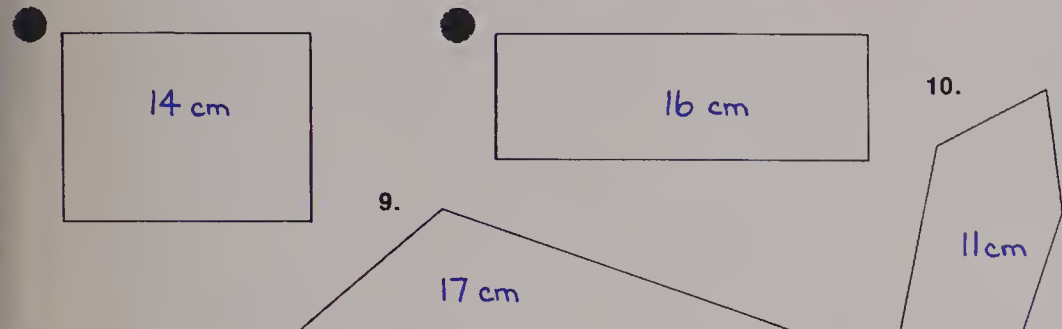


Perimeter is 14 cm.

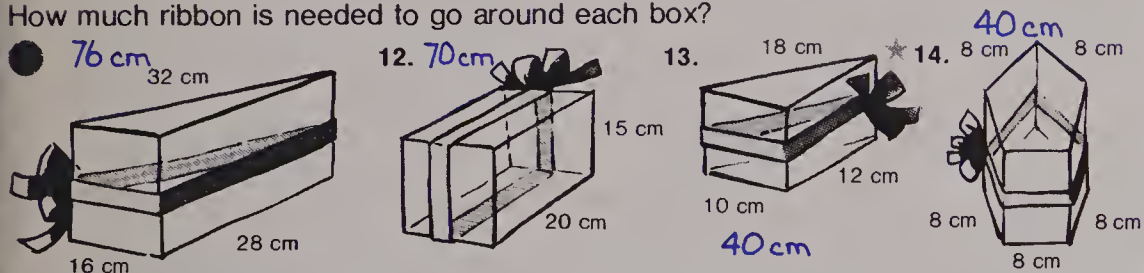
Find the perimeter.



Use your ruler. Measure each side. Add to find the perimeter.



How much ribbon is needed to go around each box?





OBJECTIVES

To develop the concept of area  
To find area by counting units of area

PACING

- Level A All
- Level B All
- Level C All

VOCABULARY

area

MATERIALS

squares of sides 2 cm

RELATED AIDS

HMS—DM25 and DM26.


BACKGROUND

It is important to develop the concept of area as being the amount of surface space or space covered. This can best be developed by providing children with experiences in "covering" shapes with different units.

SUGGESTIONS

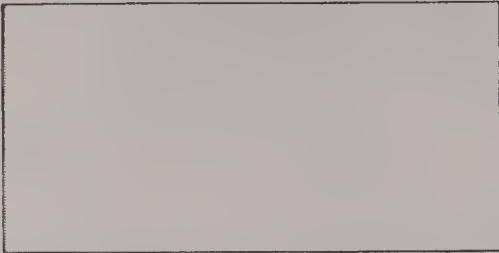
**Initial Activity** Use some flat surface area such as a table or desk. Provide the children with squares appropriately cut to size so they will just cover the desk. Ask children to cover the desk with these unit squares without overlapping. Then say, "The area of the surface is ■ square units." Repeat with other flat surfaces.

ACTIVITIES

1. Give the child a number of large square cutouts to use as square units. Direct the child to use these to find the areas of a number of specified regions. (For suitable regions you may draw rectangles or other shapes on the floor using felt pens with water soluble ink.)
2. Use "the Rectangle Game" in the Activity Reservoir.
3. Provide the child with a set of 9 squares. Ask the child to make various shapes and record the area beside the diagram of each shape. (Area is always 9 square units.)  
*Example*  
 Area is 9 square units.
4. Have the children make a square creature from squares (Activity 3) and find the area of their creature.

Counting Squares

Yvonne wanted to cover this rectangle.  
She used squares this size.



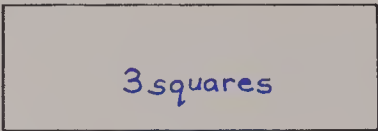
Yvonne used 8 squares.  
8 squares is the area.



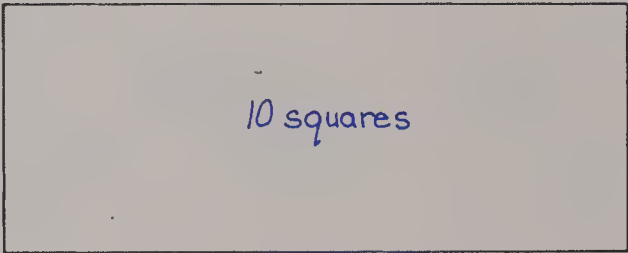
Use squares to cover each shape.  
How many are needed?  
What is the area in squares?



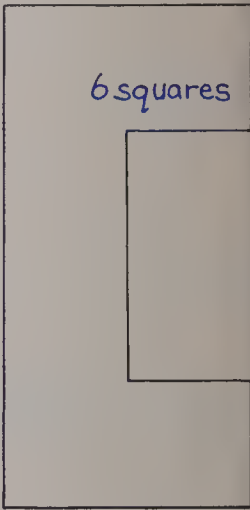
1.



2.



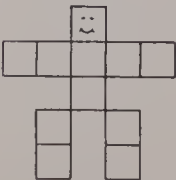
3.



192 Area, square units

**Using the Book** Provide children with material to make the squares — a page duplicated with squares of 2 cm (DM26) and 1 cm (DM25) will facilitate the cutting out. Then after a discussion of the display, develop the concept of area still further by doing the questions.

*Example*



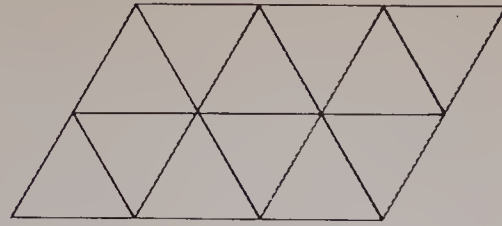
"My robot has an area of 11 square units."

# Using Triangles

Mills decided to use triangles to cover the shape.



He used this triangle.

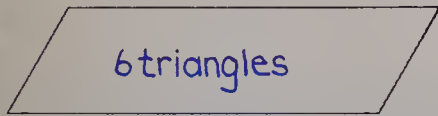


He said, "The area is 12 triangles."

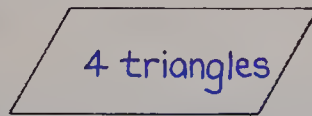
Use the triangles Mills did.

How many triangles are necessary to cover each shape?

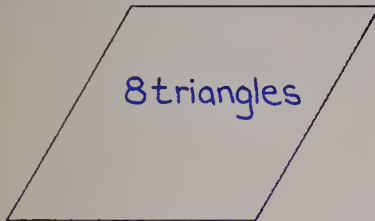
1.



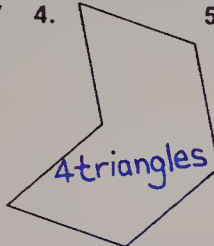
2.



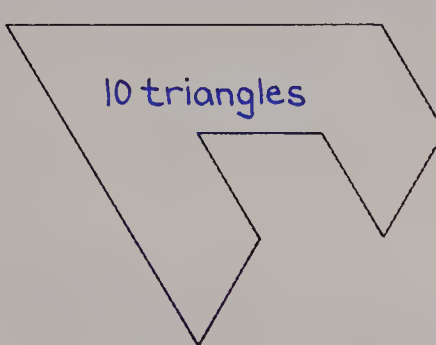
3.



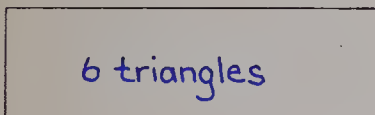
4.



5.



6.



7. Did you have difficulty with Question 6? Why?

yes The triangles extend over the edges of the shape.

Area: nonstandard units 193

**Using the Book** Provide the children with the time to do this activity of covering the shapes with triangles. After each ask, "The surface area is ■ triangle units."

When they try Exercise 6, they will not be able to cover the whole shape without having the triangles sticking over the edge. It is important to stress this point — the triangle units **MUST** not stick over the edge of the shape.

Discuss why a circle is not a good unit to use for area.

## OBJECTIVE

To use a nonstandard unit to cover shapes

## PACING

Level A 1-5

Level B All

Level C All

## MATERIALS

materials from which to cut triangles

## BACKGROUND

Any shaped unit can be used to measure area but certain shapes work better than others. Here we use nonstandard units.

## SUGGESTIONS

**Initial Activity** Use cutouts of hands. Endeavour to cover a region with the hands. The hands do not "cover" all the space; hence it is a poor unit of area. Also, the sizes of the children's hands will vary and hence not yield the same area. This can be highlighted by pointing out the area of a shape is different for one with a big hand compared to one with a small hand.

A printed page of triangles facilitates the work here. The children then need only to cut out the triangles and need not draw or trace them.

## ACTIVITIES

1. Ask the children to make a number of footprint cutouts. The child then uses these to cover a region and writes, "It takes about ■ footprints to cover ■." Discuss why the children's footprint is not a good unit to use to measure area.

2. Have the children cover a desk or table with mathematics textbooks. Discuss whether or not a math text would be a good unit of measure of area.

3. Ask the child to choose a nonstandard unit of area. Then using this unit they find the area of three shapes that are drawn ahead of time on the floor. Discuss the variety of answers obtained depending on the size of the unit used.

4. Use tangrams.

## OBJECTIVES

To find area by counting squares  
To introduce unit and half unit squares  
To introduce square centimetres

## PACING

Level A 1-14  
Level B 1, 4-17  
Level C 1, 5, 9, 12-19

## MATERIALS

1 cm squares, 4 × 4 one centimetre dot paper

## RELATED AIDS

HMS—DM23, DM25, and DM58.

## BACKGROUND

The symbol for square centimetre is  $\text{cm}^2$ .

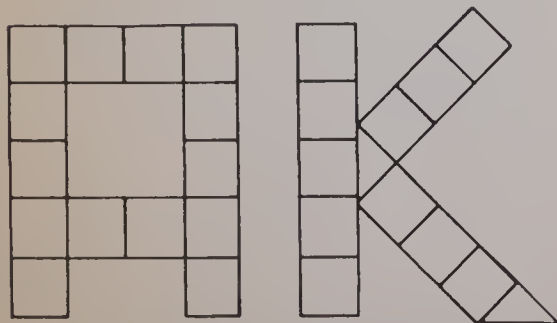
While SI metric style indicates the symbol is to be used with a number, i.e.,  $4 \text{ cm}^2$ , it is recommended that children at this time be encouraged to write "4 square centimetres" since this will help develop and reinforce the concept of area while the use of the symbol may cause confusion and a mechanical development instead of understanding.

## ACTIVITIES

1. Provide the children with coloured square and half square centimetre units. Direct them to make a pattern or shape by gluing these to a background paper. The child is to write, "My (monster, tower, house, etc.) has an area of ■ square centimetres." Display the work.

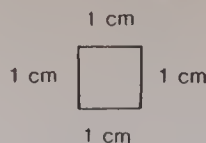
2. Use "The Rectangle Game" in the Activity Reservoir.

3. Make up or have children make up letters of the alphabet (1 per card) using centimetre and half centimetre squares. The other children are to find the area of each letter.



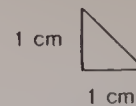
## Whole and Half Units

Each side of this square is 1 cm.

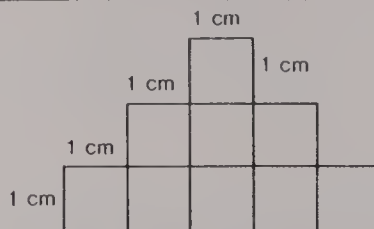


This is one square centimetre.

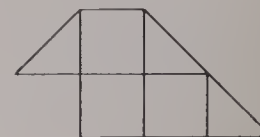
This is half of a square centimetre.



0.5 square centimetres



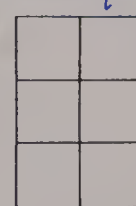
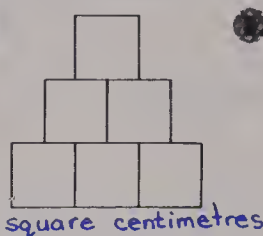
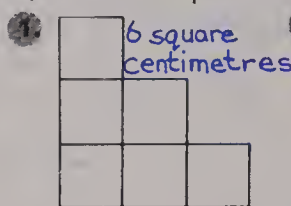
Area is 9 square centimetres.



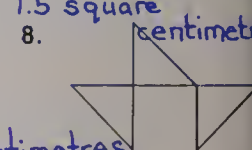
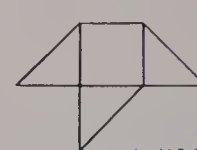
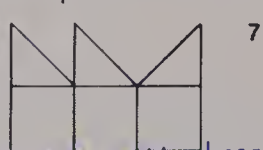
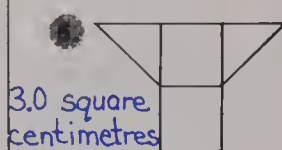
Area is 4.5 square centimetres.

Area is often measured in square centimetres.

Count the square centimetres to find the area. 6 square centimetres



Count the whole and half square centimetres to find the area.



194 Area square centimetres

**Using the Book** Discuss the display emphasizing two points. (a) The standard unit we will use here is the square centimetre. Discuss what this is. (b) The idea we can use parts of a unit also. We will use whole units — whole square centimetres — and half square centimetres.

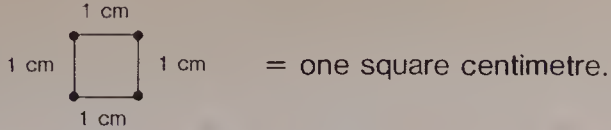
Do Exercises 1-8 orally.

In Exercises 9-17, it may be necessary for some children to put centimetre squares and half squares on shapes, then count and group the parts into pairs to make up wholes. Provide those children that require this procedure with squares and half squares.

Exercises 18 and 19 require the children to visualize how many squares are necessary. The children may want to place centimetre squares on the shapes to get the answer. DO NOT promote the *length* × *width* concept in this exercise. If some child submits this, acknowledge it and move on with the intended exercise.



Millie made shapes on the geo-board. What is the area of each shape?



9. 6 square centimetres

10. 6 square centimetres

11. 4 square centimetres

12. 2.5 square centimetres

13. 4 square centimetres

14. 4 square centimetres

Trace these dots. Make a shape with the number of square centimetres indicated.

15. 2.5 square centimetres

16. 4 square centimetres

17. 3.5 square centimetres

How many square centimetres in each shape?

18. 10 square centimetres

7 square centimetres

## OBJECTIVE

To develop the concept of volume by counting blocks

## PACING

Level A All  
Level B All  
Level C All

## VOCABULARY

volume, cubic unit

## MATERIALS

cube blocks for building

## BACKGROUND

The concept of volume requires considerable concrete experiences to develop fully. First are the experiences which will allow the child to visualize how many blocks are in an organized stack. Here we promote the number in one row, two rows, etc., one column, two columns, etc.; and finally one layer, two layers, etc.

Some children may have difficulty in realizing that 12 blocks in one stack ( $2 \times 3 \times 2$ ) has the same number of blocks when stacked tall ( $1 \times 4 \times 3$ ). (Conservation of Volume.)

## SUGGESTIONS

**Initial Activity** Working in small groups, make a shape using 6 blocks. Ask how many blocks. Build a different shape using the same 6 blocks. Ask how many blocks now. Let children count if necessary. If you feel the children are not conserving, provide more experiences in making shapes with a specific number of blocks.

Using blocks, make a pile as in the display. Ask how many blocks are used. Repeat for different simple shapes. Do not formalize a method at this time. The children will likely count to get the answer.

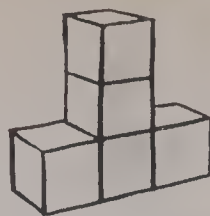
Work in groups of two children. Provide the children with a number of blocks. Direct one child to build a shape. The other child is to count the number of cubes used. Then the two children reverse roles. (In addition to building the concept of volume, this provides a basis for the development of conservation.)

## ACTIVITIES

1. Children can play a game "How Many Cubes?" While one child's back is turned, the other child builds a shape using cubes. The first child then looks at the shape and calculates or

# Counting Blocks

Jill used cubes to build this shape.



She used 5 cubes.

5 cubic units is the **volume**.

Max built this shape.

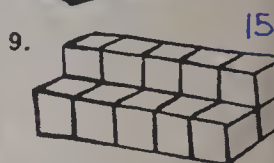
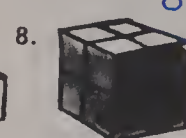
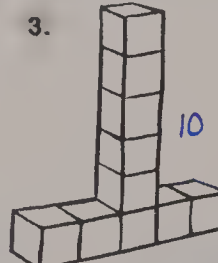
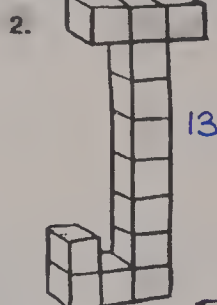


He used 8 cubes.

The **volume** is 8 cubic units.



How many blocks?



196 Volume

**Using the Book** Discuss the display. Do exercises 1-9 orally.

Demonstrate a question similar to that in Exercise 10 using 1 layer of 3 blocks, 2 layers, then 3 layers. This will reinforce the multiplication tables covered in the previous chapter. However some children may count: 3, 6, 9 or 4, 8, 12. The method the children use at this time is not important although multiplication will be required later. Do Exercises 10 and 11 orally. Watch carefully to note the method each child is using. Some children may want to build the model in order to count the cubes.


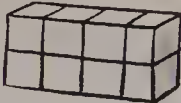
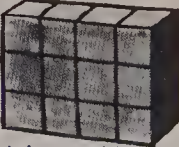

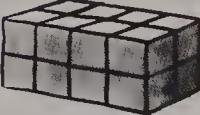
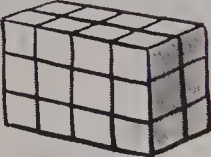

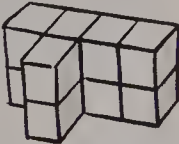
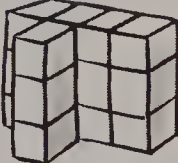
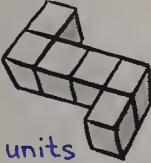
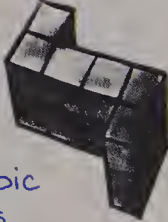

counts the number of cubes used. The children then exchange roles. After 5 turns the child with the most correct is the winner.

2. Provide two children with the same number of cubes (6). Each is to build a shape. They look at each other's shape and answer the question, "How many cubes were used?"

3. Work in groups of two

children. One child takes a certain number of cubes and builds a shape while the other child's back is turned. The second child looks at the model, counts or guesses how many cubes were used, and then counts out of another set that many cubes and tries to build a second shape exactly like the first.

How many cubic units?

|     |  |  | One layer  | Two layers   | Three layers  |
|-----|--|--|--|--|---|
| 10. |  |  |   |   |   |
|     |  |  | 4 cubic units  | 8 cubic units  | 12 cubic units  |
| 11. |  |  |   |   |   |
|     |  |  | 8 cubic units  | 16 cubic units   | 24 cubic units  |
| 12. |  |  |   |   |   |
|     |  |  | 5 cubic units  | 10 cubic units   | 15 cubic units  |
| 13. |  |  |  |  |  |
|     |  |  | 6 cubic units  | 12 cubic units   | 18 cubic units  |



## OBJECTIVES

- To introduce cubic units as the measure of volume
- To find volume by counting cubic units
- To introduce cubic centimetres

## PACING

- Level A 1-16
- Level B 1-16
- Level C 4-17

## VOCABULARY

cubic centimetre

## MATERIALS

cubes for building models, centimetre cubes

## RELATED AIDS

HMS—DM59.

## BACKGROUND

The symbol for cubic centimetre is  $\text{cm}^3$ . While SI metric style indicates the symbol is to be used with a number, i.e.,  $3 \text{ cm}^3$  and not "3 cubic centimetres", at this stage in the development of the cubic units, it is recommended that children be encouraged to write "3 cubic centimetres" since the symbol may cause confusion and inhibit the development of the concept of volume.

## SUGGESTIONS

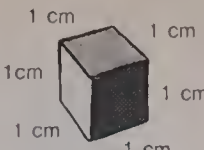
**Initial Activity** Discuss volume by asking what the word "volume" means. The child may say volume has to do with loudness of the television. If so, show him a rectangular solid or a rectangular box and emphasize that volume also has to do with the number of cubes it takes to fill the space inside. Discuss the need for standard units of volume. Have two children each make a cube from Plasticine. Then discuss the number of cubes needed to fill a given box (shallow, please!). Elicit that they would need more smaller units and fewer large units. We need a standard unit so everybody will have the same idea about the volume of an object.

## ACTIVITIES

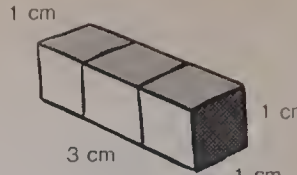
1. *Extension.* How many different shapes can you make using (a) 4 blocks? (b) 6 blocks? (c) 8 blocks?
2. Provide each pair of children with a given number of cubes. One child builds a shape. The other child counts the number of blocks used. Then they reverse roles. (The counting

## Volume

Each side of this cube is 1 cm.



Volume: one cubic centimetre




Volume: three cubic centimetres

**Volume is often measured in cubic centimetres.**

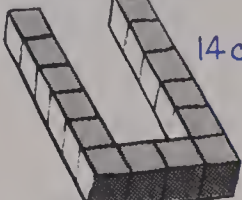
How many cubes?

1.




11 cubes

2.



14 cubes


3.



14 cubes


What is the volume? Each cube is a cubic centimetre.

4.




6 cubic centimetres

5.




12 cubic centimetres

6.



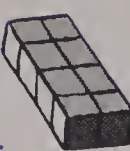
18 cubic centimetres

7.




4 cubic centimetres

8.



8 cubic centimetres

9.



16 cubic centimetres

198 Volume cubic centimetre

**Using the Book** Discuss the display: a common unit of volume is the cubic centimetre (do not introduce the symbol  $\text{cm}^3$  at this time).

The volume of the figure is three cubic centimetres.

Do Exercises 1-6 orally.

Exercises 13-16 involve half units.

Encourage the children to find the volume by counting the number of cubic units in one row, then the number in two rows, three rows, etc.; for example, 4, 8, 12, 16.

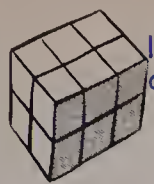
Exercise 17 can be done by counting by (a) twos (b) fours (c) nines.

is an important aspect. Also this activity reinforces conservation.)

3. Provide the child with an open box into which fits cubes (such as a box of cube sugar). The child first counts the number of cubes in 1 row

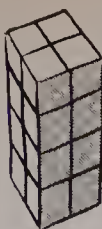
(in bottom layer), then number of cubes in 2 rows, 3 rows, etc. until bottom layer is covered (for example, 4, 8, 12, ..., 24). Then they count the number in the next layer, etc. Repeat for other boxes.

10.



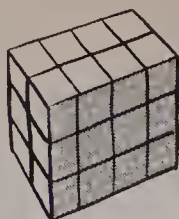
12 cubic centimetres

11.

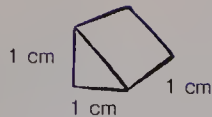


16 cubic centimetres

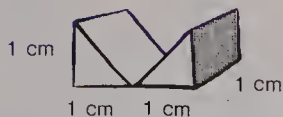
12.



24 cubic centimetres

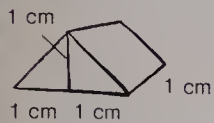


one-half cubic centimetre  
0.5 cubic centimetres

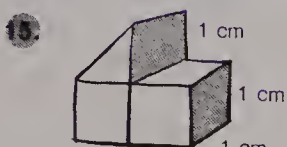


Volume? 1.0 cubic centimetres

How many cubic centimetres?

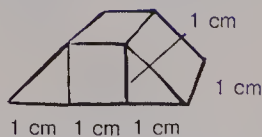


1.0 cubic centimetres



2.5 cubic centimetres

16.



2.0 cubic centimetres

17. How many cubic centimetres? Paint was spilt on each block.

8 cubic centimetres

(a)



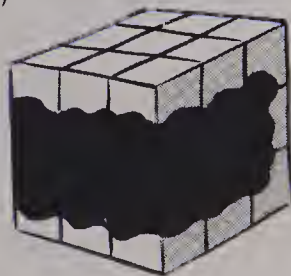
16 cubic centimetres

(b)



27 cubic centimetres

(c)



## OBJECTIVE

To review capacity: the litre and millilitre

## PACING

Level A 1-5  
Level B 1-5  
Level C All

## MATERIALS

containers of these sizes: 100 mL, 0.5 L, 1 L, and 2 L

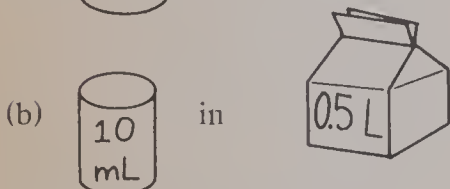
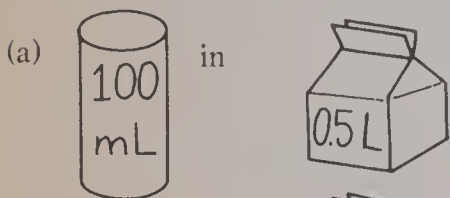
## RELATED AIDS

HMS—DM60.

## ACTIVITIES

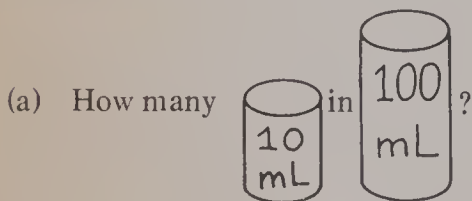
1. Provide different containers. Ask the child to find how many (a) litres in each (b) half litres in each (c) 100 mL to fill each.

2. Ask a child to show or find how many

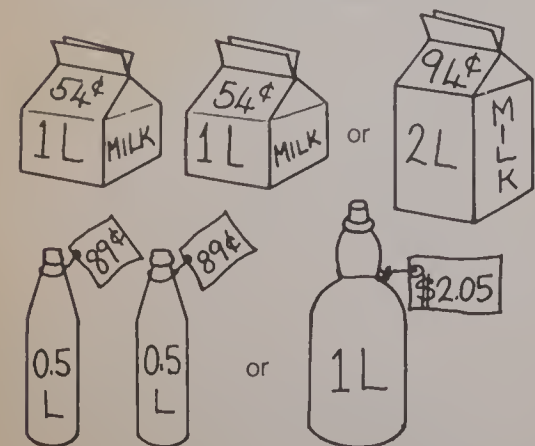


3. Use the "Metric Bingo" game from the Activity Reservoir.

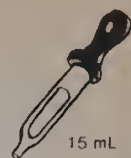
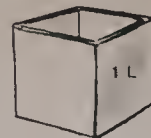
4. Extension.



(b) Which is the better buy?

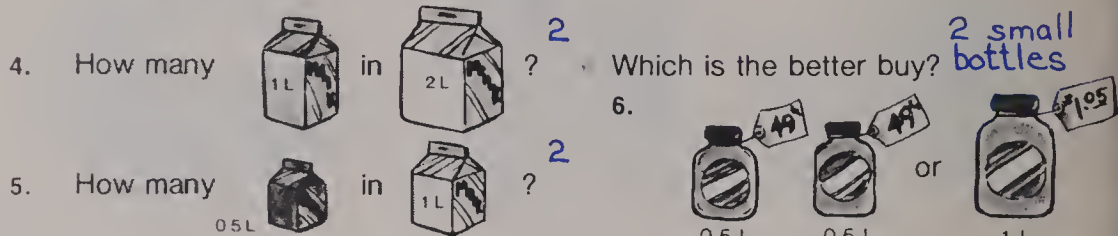
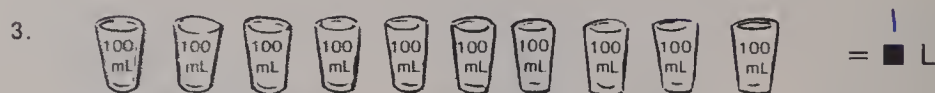


## Litres and Millilitres



$$1000 \text{ mL} = 1 \text{ L}$$

How many litres?



200 Units of capacity: review

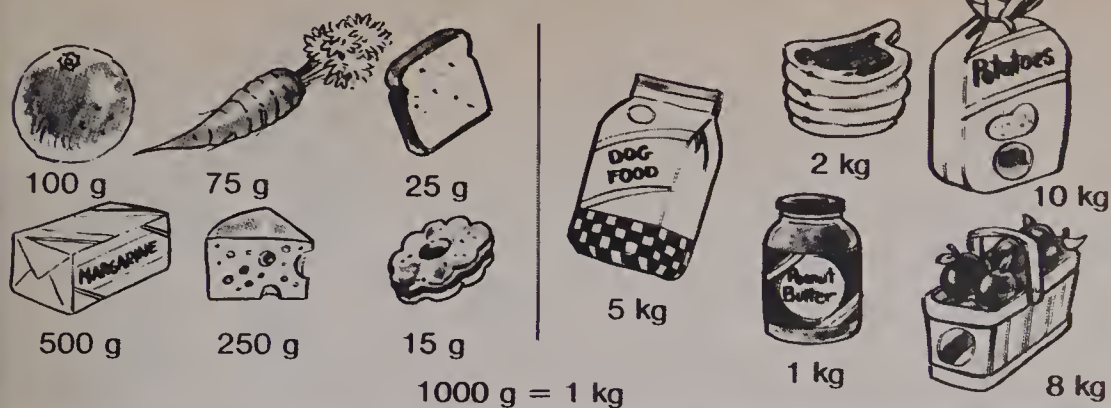
**Using the Book** Discuss the display. Demonstrate and ask, "How many 1 L cartons are needed to fill a 2 L carton?"

Demonstrate and ask, "How many 0.5 L cartons are needed to fill a 1 L carton?"

Then review counting by hundreds. Ask, "How many hundreds are there in a thousand?" Then demonstrate and ask, "How many 100 mL in 1000 mL?" Have a child use the 100 mL glass to fill the 1000 mL (1 L) container with water — "How many glasses are necessary?"



# Kilograms and Grams



## OBJECTIVE

To review mass: the kilogram and gram

## PACING

Level A All  
Level B All  
Level C All

## MATERIALS

scales in grams and kilograms, objects with masses ranging from 10 kg to 2 kg

You may wish to use plastic zip bags with gravel, and label the bags according to the mass of each.

## RELATED AIDS

HMS—DM60.

## ACTIVITIES

1. Have the child make a list of items that separately or combined have a mass of:

- (a) 100 g      (b) 500 g
- (c) 1 kg      (d) 5 kg.

(Provide scales.) The right side of the display may help here.

2. Use plastic zip bags with gravel labelled A, B, C, . . . . Each is to have a different mass such as 250 g, 500 g, 1 kg, 2 kg, 3 kg. Each child is to estimate and record the mass of each. After estimating they check using the scale.

3. As an alternate the children are to place the bags from Activity 2 in order from lightest to heaviest — without the use of scales.

## EXTRA PRACTICE

1. Write these additional practice exercises on the chalkboard.

How many grams?

- (a) 5 oranges and 1 margarine
- (b) 3 cheese and 10 slices of bread
- (c) 10 carrots and 1 cheese
- (d) 2 cheese and 1 margarine

How many kilograms?

- (a) 2 dog food, 2 boxes of apples, and 2 roasts
- (b) 2 bags of potatoes and 3 boxes of apples
- (c) 5 peanut butter and 5 roasts
- (d) 1 dog food, 1 roast, 1 bag of potatoes, 1 box of apples, and 1 peanut butter

1. How many grams in 10 oranges? 10 carrots? 10 slices of bread?

10 cookies?

150 g

1000 g

750 g

250 g

What is the mass of the following?

2. 765 g

3. 11 kg

4. 23 kg

Round to the nearest kilogram.

5. 2 kg

6. 2 kg

Round to the nearest 10 kg.

7. 10 kg

8. 30 kg

Units of mass: review 201

**Using the Book** You might discuss the display on the left first by asking what information one gets from the display. After taking a number of answers, ask how many grams in a cookie and an orange, in 2 carrots, etc. Then do Exercise 1 orally as a group activity. Then assign Exercises 2-4.

Review rounding by doing Exercises 5 and 6 orally as a group activity.

Assign Exercises 7 and 8.

## OBJECTIVES

- To state the question asked and the information given in a word problem
- To select a number sentence that fits a problem

## PACING

- Level A All  
Level B All  
Level C All

## BACKGROUND

See Chapter Overview.

## ACTIVITIES

1. Prepare several short word problems printed on envelopes. Prepare, also, more than enough number sentences to solve the problems. The task is to select the correct number-sentence card and place it in the correct envelope.
2. Provide the child with an interesting picture. Ask the child to make up one addition question, one subtraction question, and one multiplication question. Give the questions to other children to do.

## EXTRA PRACTICE

1. Have 47 black fish.  
Have 26 yellow fish.  
How many altogether?  
 $47 + 26 = \blacktriangle$   
 $47 - 26 = \blacksquare$   
 $73 - 26 = \bullet$
2. Had 28 kittens.  
Sold 17 kittens.  
How many left?  
 $28 + 17 = \blacktriangle$   
 $28 - 17 = \blacksquare$   
 $28 - 11 = \bullet$
3. Four parrots in a cage.  
Two more parrots put in the cage.  
How many in all?  
 $6 - 4 = \blacktriangle$   
 $4 + 2 = \blacksquare$   
 $4 - 2 = \bullet$
4. Had 16 turtles.  
Sold 12 turtles.  
How many turtles left?  
 $16 + 12 = \blacktriangle$   
 $16 - 12 = \blacksquare$   
 $16 \div 4 = \bullet$
5. Four dog collars in each box.  
Two boxes of dog collars.  
How many dog collars?  
 $4 - 2 = \blacktriangle$   
 $4 + 2 = \blacksquare$   
 $4 \times 2 = \bullet$

## A Pet Shop

7 brown rabbits.  
3 white rabbits.  
How many more brown rabbits?

| Need to find   | We know            | How to find |
|----------------|--------------------|-------------|
| how many more? | 7 brown<br>3 white | subtract    |



Which number sentence fits the problem?

$7 + 3 = \blacktriangle$

$7 - 3 = \blacksquare$

$7 - 4 = \bullet$

1. There are 6 canaries in one cage.  
There are 4 canaries in another cage.  
How many canaries altogether?  
(a) How do we find how many altogether? *add*  
(b) Which number sentence fits the problem?  
 $6 + 4 = \blacktriangle$     $6 - 4 = \blacksquare$     $6 - 2 = \bullet$
2. There are 9 brown puppies.  
There are 6 black puppies.  
How many more brown puppies?  
(a) What must we find? *how many more brown puppies there are than black puppies*  
(b) Which number sentence fits the problem?  
 $9 + 6 = \blacktriangle$     $9 - 6 = \blacksquare$     $9 + 3 = \bullet$

202 Choosing number sentences

**Using the Book** Discuss the display. Ask whether the question requires the child to add, subtract, multiply, or divide to get the answer. Ask how they decide what to do. ("How many more" usually tells "to subtract".)

You may ask the child to make and complete a chart like the one in the display for the questions.

Each question should be discussed with the child or class.



# Calendar

30 days has September,  
April, June, and November.  
All the rest have 31  
Except February, the only one  
Which has 28 days clear  
And 29 in each Leap Year.

Months of the Year:

January, February, March, April,  
May, June, July, August, September,  
October, November, December.

## March

| Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
|--------|--------|---------|-----------|----------|--------|----------|
|        |        |         |           |          |        | 1        |
| 2      | 3      | 4       | 5         | 6        | 7      | 8        |
| 9      | 10     | 11      | 12        | 13       | 14     | 15       |
| 16     | 17     | 18      | 19        | 20       | 21     | 22       |
| 23     | 24     | 25      | 26        | 27       | 28     | 29       |
| 30     | 31     |         |           |          |        |          |

Read the poem.

1. How many days in April? <sup>30</sup> September? <sup>30</sup> January? <sup>31</sup> July? <sup>31</sup> November? <sup>30</sup>
2. How many months in a year? <sup>12</sup>
3. Which month has the fewest days? <sup>February</sup>
4. Which months have 31 days? <sup>30 days: January, March, May, July, August, October, December</sup> 30 days: <sup>31 days: April, June, September, November</sup>  
Look at the calendar for March.
5. Name the days of the week in order. <sup>Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday</sup>
6. Which day is March 1 on this calendar? <sup>Saturday</sup>
7. How many days in a week? in 2 weeks? in 3 weeks? in 4 weeks? <sup>7, 14, 21, 28</sup>
8. On which day is March 11? <sup>Tuesday</sup>
9. How many days in February in a Leap Year? <sup>29</sup>

The calendar 203

**Using the Book** Ask the children to learn the verse in the display.

Using the verse the children should do Exercise 1. They can check using the calendar.

Explain that each year is a little more than 365 days — in fact, about  $365\frac{1}{4}$  days. Every four years we add one extra day. This is a Leap Year. Ask the child to look at two calendars — one a regular and one a Leap Year calendar — and ask which month has the extra day.

Assign the balance of the page.

## OBJECTIVES

- To tell how many days in each month, including in a Leap Year
- To name the months of the year
- To tell how many days in a given number of weeks
- To tell which day of the week a given date falls, given a calendar

## PACING

- Level A All
- Level B All
- Level C All

## MATERIALS

two large calendars — one of a Leap Year and one of a non-leap year (preferably one is the current year)

## SUGGESTIONS

**Initial Activity** Discuss the months of the year in order, the number of days in each month, and the number of weeks in a year.

## ACTIVITIES

1. Give the children calendars, then ask questions such as:
  - (a) the day of the week on which special days fall: January 1, February 14, etc.
  - (b) the date one week from now; one week ago.
  - (c) Each Leap Year has one additional day. How many days in a normal year? in a Leap Year?
2. Have the children make a calendar for this month. The children write the month and year and ring each day they are in school.
3. Calendar X's and O's. Use an old calendar page. A player must get 4 of his marks in a row to win. His score is the sum of the 4 dates in the row. The winner is the player with the highest score after 6 games. A calendar page may be laminated and the game played with felt pens with water soluble ink.



## OBJECTIVES

To read a thermometer  
To estimate temperature in degrees Celsius

## PACING

Level A All  
Level B All  
Level C All

## VOCABULARY

temperature, boils, normal, degrees Celsius, fever

## MATERIALS

a large model thermometer graduated in ones (the type that has an adjustable red ribbon to indicate the temperature), real thermometers graduated in ones or twos and tens

## BACKGROUND

Reading a thermometer requires the development of the skill of reading a scale.

It is expected children will keep certain referent temperatures in mind.

## SUGGESTIONS

**Initial Activity** Using the large classroom model of a thermometer, set the red ribbon to show a temperature, ask a child to read the temperature, and repeat until you feel the class is ready to do the exercises.

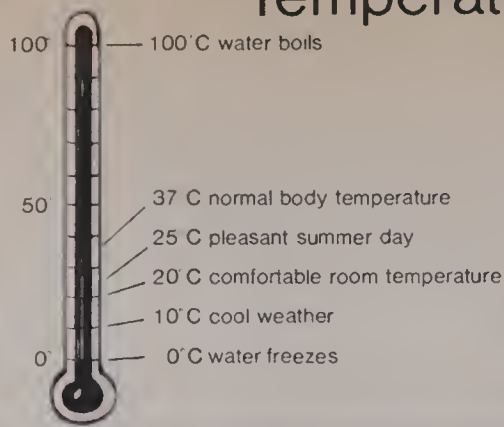
## ACTIVITIES

1. The children can record the outside temperature at the same hour for several days. Then using a moveable strip demonstration thermometer, they can indicate how the temperature changed from day to day.

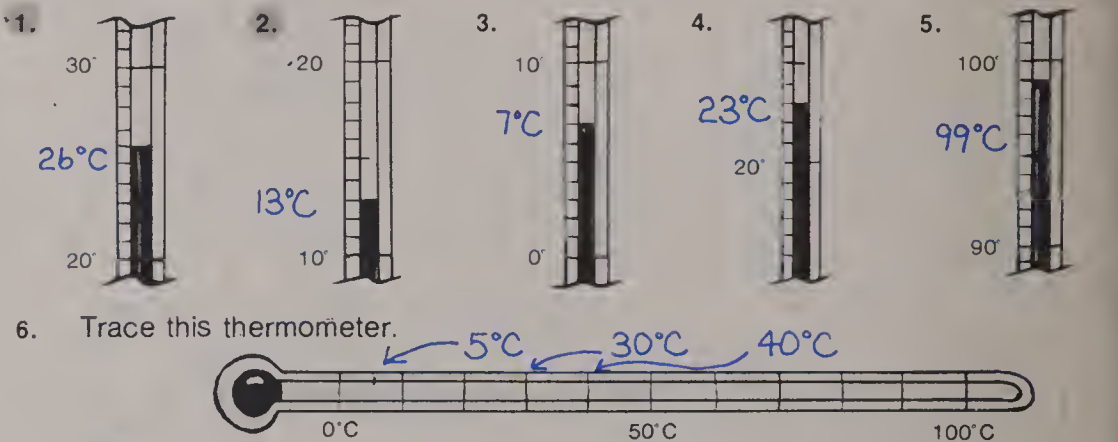
2. Demonstrate or have the children record the initial temperature of a glass of very warm tap water. Add an ice cube. Record the temperature every minute as the temperature drops. (Stir water before each measurement.)

3. Ask the children to get information from the school library or encyclopedia about temperatures in various parts of the world. Temperature extremes can be particularly interesting.

## Temperature



Write the temperatures.



Mark

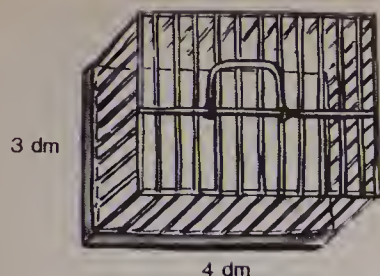
(a) 40°C (fever temperature). (b) 30°C (hot day). (c) 5°C (cold fall day).

204 Degrees Celsius

**Using the Book** Discuss the display. Emphasize the temperatures shown by asking questions such as, "What is the temperature shown for a pleasant summer day? for a cold summer day, etc."

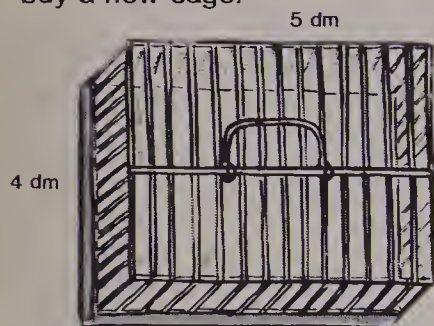
# Pet Shop Clerk

1. Syd bought a hamster cage.



What is its area? *12 square decimetres*

3. Syd went back to the shop to buy a new cage.



Is this cage large enough? *yes*

5. Dawn needs a fishbowl.  
Each fish needs 2 L of water.  
She wants 3 fish.

How large a bowl is needed?  
*a bowl that will hold 6L of water*

2. At home, he read...



By how much is the cage too small?  
*3 square decimetres*

4. The new cage is 26 cm tall.  
An exercise wheel is 3 dm tall.  
Will the wheel go in the cage? *No*



6. Cost of fish:
- |                 |        |
|-----------------|--------|
| fantail         | \$1.25 |
| comet           | \$1.75 |
| black telescope | \$2.25 |
| goldfish        | \$0.75 |

Dawn has \$4.50 for fish.  
Which 3 fish can she buy?

## OBJECTIVE

To practise solving word problems involving measurement

## PACING

Level A All  
Level B All  
Level C All

## MATERIALS

suitable items to make your play store into a pet shop

## BACKGROUND

See Chapter Overview.

## ACTIVITIES

1. Ask the children to write a short story about what they think it would be like working in a pet shop — the things they would have to do, the pets they would have to take care of, and so on.

2. Ask the children to make up two questions of the type they might have to solve if they worked in a pet shop or if they bought something at a pet shop. Each child should illustrate the problem and post the illustration and problem on the bulletin board. The child should write the solution on the back so others can check their work when they do the question.

3. Use "The Rectangle Game" in the Activity Reservoir.

Word problems 205

**Using the Book** Refer to the steps in the display on page 202. Use these steps in structuring solutions to Exercises 2, 4, 5, and 6. In Exercises 1 and 3 the children will have to visualize the number of squares in one row, then they count the number of rows. Exercise 1: 4, 8, 12 squares. Exercise 3: 5, 10, 15, 20 squares. Some children may profit from making 3 dm by 3 dm cage floor using squares. Model-building is an excellent problem-solving technique.

Discuss with the class, the pets they have at home and the care the pets require. Have the children dramatize by being customers coming into a pet shop buying items from the clerk. This would be a review of money and making change.

Answer:

6. She can buy the goldfish, fantail, and comet or the goldfish, fantail, and black telescope.



## OBJECTIVES

To review telling time  
To write time in the **■:■** form  
(digital)

## PACING

Level A All  
Level B All  
Level C All

## MATERIALS

a model twelve-hour clock, a model digital clock

## RELATED AIDS

HMS—DM61.

## SUGGESTIONS

**Initial Activity** Review counting by 5's.

## ACTIVITIES

1. Prepare a bulletin board display of times and things children do at these times.

*Examples*

08:00 breakfast  
10:15 recess — playing  
12:00 noon — eating or going home  
04:30 playing  
06:00 dinner  
07:30 favourite TV show  
08:30 going to bed

2. Distribute blank  $5 \times 5$  grids to each child. Have them fill each blank with a time notation of their choosing. (You may wish to restrict these limits, i.e., time on the hour or on the half hour or to the minute between 09:00 and 10:00.) Play Bingo by calling a time aloud or displaying a clock to the group.

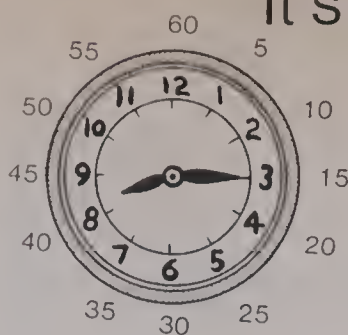
3. Provide "Concentration" cards which match 2 ways of telling time:

**03:30** and **three thirty**. General

Concentration rules are in Activity 3, page 129.

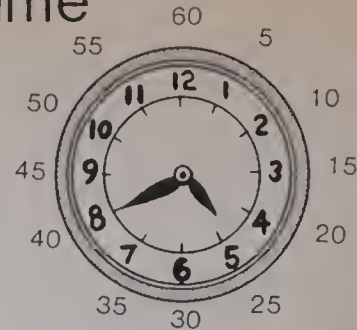
4. Make a journal. Have each child make a journal for 1 d or describe how their day is spent.

## It's About Time



Fifteen minutes after eight.

**08:15**



Forty minutes after four.

**04:40**

Read aloud the time.

1.



2.



3.



4.



5.



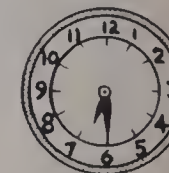
6.



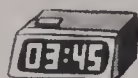
7.



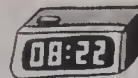
8.



9.



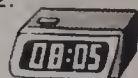
10.



11.



12.



(1) 08:10 (2) 02:15 (3) 05:40 (4) 03:50 (5) 10:25 (6) 11:55  
(7) 07:35 (8) 06:30

13. Write the times in Questions 1 to 8 in the form 06:20.

206 Time

**Using the Book** Explain there are sixty minutes in one hour. Show how to count by fives around the face of a clock.

Show how to count by fives, then by ones, to count the number of minutes after the hour.

Show the two ways to write time.

In writing time such as 08:35, mention that the zero is a placeholder. Some digital clocks do not show the zero. If some children at this age neglect the zero, do not worry about it.

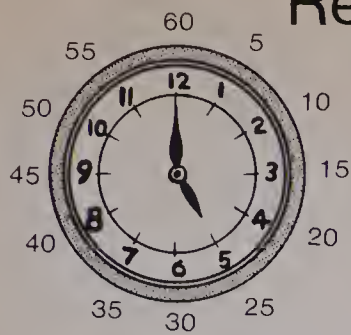
Do Exercises 1-12 orally as a class activity. Combine pages 206 and 207 into one day's lesson.

### Answers:

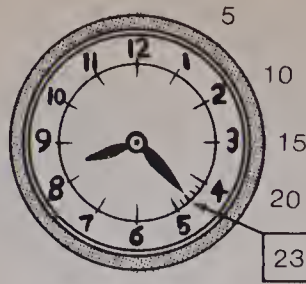
1. Ten minutes after eight.
2. Fifteen minutes after two.
3. Forty minutes after five.
4. Fifty minutes after three.
5. Twenty-five minutes after ten.
6. Fifty-five minutes after eleven.
7. Thirty-five minutes after seven.
8. Thirty minutes after six.
9. Forty-five minutes after three.
10. Twenty-two minutes after eight.
11. Five minutes after ten.
12. Five minutes after eight.



# Reading Time



60 min  
in 1 h



23 min after 8  
08:23

What time? Write two ways.

1. 30 min after 3  
03:30

2. 30 min after 11  
11:30

3. 1 min after 3  
03:01

4. 3 min after 4  
04:03

5. 12 min after 10  
10:12

6. 8 min after 7  
07:08

7. 23 min after 6  
06:23

8. 52 min after 1  
01:52

Write the time in the form ● : ▲.

9. 10 min after 6 06:10    10. 24 min after 8 08:24    11. 55 min after 3 03:55  
12. 8 min after 11 11:08    13. 2 min after 7 07:02    14. 3 min after 9 09:03

Time 207

**Using the Book** Use the clock in the left part of the display to point out that: (a) it takes 5 min for hands to move from one number to the next, (b) there are 60 min in each hour. Use the clock in the right part of the display to demonstrate telling time to the minute: (a) count by fives, (b) then count by ones to tell how many minutes after the hour.

Assign exercises. Be sure to clarify instructions for Exercises 9-14.

## OBJECTIVE

To write time in ● : ▲ form and  
■ min after ◆ form

## PACING

Level A 1-8  
Level B 1-8  
Level C 1-4, 9-14

## MATERIALS

a model twelve-hour clock, a model digital clock

## RELATED AIDS

HMS—DM61.

## SUGGESTIONS

**Initial Activity** Set both model clocks at 08:15. Elicit from the child that this is read as “eight fifteen” and as “fifteen minutes after eight”. Set the twelve-hour clock at 08:23. Ask the child to set the digital clock so it says the same time (or have child write the time on the chalkboard in the ● : ▲ form). Elicit the time in the “■ min after ◆” form.

## ACTIVITIES

1. Have children work in pairs. One child sets the clock for a certain time. The other child writes the time in the two forms. Children reverse roles. The child with the most correct after five turns of writing the time is the winner.
2. Have children work in pairs. One child sets the first clock. The second child sets the second clock. The first child has to determine how many hours and minutes between the two times. (The second child must know the answer also.) Children reverse roles and repeat. The child with the most correct after five turns is the winner.
3. Play Concentration, modified to suit the concept and level of child.

## OBJECTIVE

To write minutes before the hour in twelve-hour clock notation

## PACING

Level A 1-8  
Level B 1-14  
Level C 1-4, 9-18

## MATERIALS

demonstration clocks  
Provide the children with blank clocks (no hands).

## RELATED AIDS

HMS—DM61.

## BACKGROUND

So far the children have given time as "■ min after ♦". Here we introduce "■ min before ♦".

The twenty-four hour clock will be dealt with in Grade 4.

## ACTIVITIES

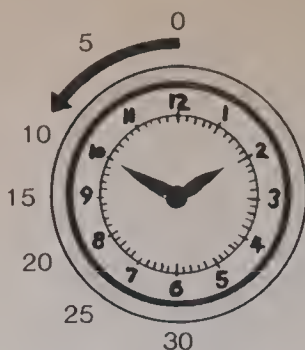
1. As a group activity, have children take turns calling out times in the form "■ min before ♦". The children take turns showing the time on the demonstration clock and writing in as many ways as is suitable.

Endeavour to elicit from the child the fact that "20 min to 8" is "40 min after 7" ( $60 - 20 = 40$  relationship).

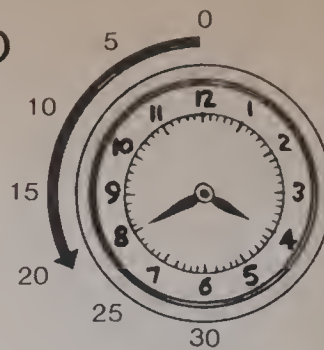
2. Display two clocks set for different times. Ask how many hours (and minutes) from one to the other.

3. Use the cards prepared for Concentration (see previous 2 pages) to play Snap.

## Minutes To



We can count minutes backward on the clock.



It is 20 min before 04:00.  
20 min to 4.  
03:40

Give the time of each as: (a) ■ min to ♦

(b) ●:▲

1.



15 min to 4  
03:45

2.



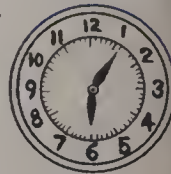
20 min to 12  
11:40

3.



10 min to 2  
01:50

4.



54 min to 7  
06:06

5.



47 min to 6  
05:13

6.



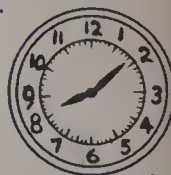
58 min to 7  
06:02

7.



32 min to 11  
10:28

8.



51 min to 8  
08:09

Draw clocks to show these times.

- |                 |                 |                  |
|-----------------|-----------------|------------------|
| 9. 25 min to 6  | 10. 5 min to 3  | 11. 23 min to 12 |
| 12. 13 min to 8 | 13. 9 min to 11 | 14. 18 min to 1  |

How many minutes?

- |                    |        |                    |        |
|--------------------|--------|--------------------|--------|
| 15. 1 h and 15 min | 75 min | 16. 1 h and 35 min | 95 min |
|--------------------|--------|--------------------|--------|

How many hours from

- |                     |    |                     |    |
|---------------------|----|---------------------|----|
| 17. 01:15 to 08:15? | 7h | 18. 05:22 to 10:22? | 5h |
|---------------------|----|---------------------|----|

208 Time

**Using the Book** Discuss the display pointing out that we can tell time by telling how many minutes before the hour. To do this we count by 5's backward from 12. Show the three ways to write the time as illustrated.

Provide blank clock faces for Exercises 9-14.

Do Exercise 15 as a class activity.

# Writing Number Sentences

We write number sentences to solve problems.

Mary brought 12 chocolate cookies.  
Marie brought 8 raisin cookies.  
How many cookies altogether?



Number sentence.

$$\begin{array}{ccccccc} 12 & + & 8 & = & 20 \\ \text{chocolate} & & \text{raisin} & & \text{cookies} \\ \text{cookies} & & \text{cookies} & & \text{altogether} \end{array}$$

Solve each number sentence.

- |  |   |
|--|---|
| <p>1. 4 red balloons.<br/>7 blue balloons.<br/>How many altogether?<br/><math>4 + 7 = \blacktriangle 11</math></p> | <p>2. 12 bottles of lemonade.<br/>8 children.<br/>How many more bottles?<br/><math>12 - 8 = \blacktriangle 4</math></p> |
|--|---|

Write a number sentence for each. Solve it.

- |   |   |
|---|---|
| <p>3. 5 ham sandwiches.<br/>8 cheese sandwiches.<br/>How many altogether? <math>5 + 8 = 13</math></p> | <p>4. 14 hot dogs.<br/>9 hot dogs eaten.<br/>How many left? <math>14 - 9 = 5</math></p> |
| <p>5. 15 marshmallows.<br/>12 eaten.<br/>How many not eaten? <math>15 - 12 = 3</math></p>             | <p>6. 9 red ants.<br/>8 black ants.<br/>How many ants? <math>9 + 8 = 17</math></p>      |

Number sentences 209

**Using the Book** Refer to the steps in the display on page 202. Use these steps in structuring solutions to the problems on this page:

- What do you need to find — is there a key word?
- What do we know — what information is given?
- What do we need to do to get the answer?
- What words tell us whether to add or subtract?
- Write a number sentence.
- Solve the number sentence.
- Write a word sentence to answer the question that was asked.

## OBJECTIVE

To write a number sentence to solve a word problem

## PACING

Level A All  
Level B All  
Level C All

## VOCABULARY

raisin, marshmallows

## RELATED AIDS

HMS—DM62.

## SUGGESTIONS

**Initial Activity** The topic and artwork as shown in the display make this an ideal and easy page to demonstrate a short word problem using real cookies and relevant children's names.

## EXTRA PRACTICE

Write these questions on the chalkboard or duplicate.

1. Mabel hoed the garden for 2 h.  
She watered the garden for 3 h.  
How long did she work altogether?
2. Harry mowed the lawn for 3 h.  
He did this 2 times in the week.  
How long did he work altogether?
3. Father paid Jill for 6 h of work.  
Jill worked for 5 h.  
How much longer must she work?
4. Pat worked 10 h altogether.  
He worked 2 h each time.  
How many times did he work?
5. Sherri clipped the hedge for 45 min.  
She raked leaves for 20 min.  
How long did she work altogether?



OBJECTIVE

To find the time some minutes later than a given time

PACING

- Level A 1-3 (except 2(c) and (d))
- Level B 1-3
- Level C All

MATERIALS

demonstration clocks, duplicated clock faces without hands

RELATED AIDS

HMS—DM61.

SUGGESTIONS

Initial Activity Display the clock and give this problem:

Henry left home at 08:25.  
He arrived at school 18 min later.  
What time did he get to school?  
Ask the child to illustrate this on the clock by setting the clock at 08:25, then moving the minute hand ahead 18 min. What time is it now?  
Have the other children count as he moves the minute hand ahead.  
Discuss and show how many minutes in (a) a half hour (b) a quarter hour.

ACTIVITIES


1. Display two clocks, one set for a specific time. Ask a child to set the second clock for some minutes (or hours or hours and minutes) later. (For example, 45 min later, 2 h later, ★1 h and 10 min later.)

2. Display the two clocks set for, say, 10 min difference. Ask the children to write down several things they can do in that length of time. Discuss.

3. Prepare two sets of cards and a model clock.

Set 1

Time Cards



Time Now

Set 2

Activity Cards

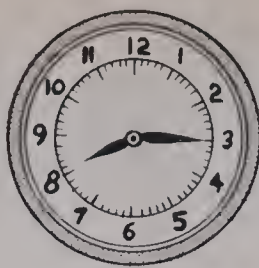
Going to eat lunch.  
Will take 20 min.  
What time will it be then?

Child selects one card from each pile. He sets his model clock at the time after the activity. Second person checks. They then reverse roles.

Minutes Later

Linda ate breakfast

Linda left for school



08:15

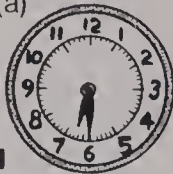
20 min later



08:35

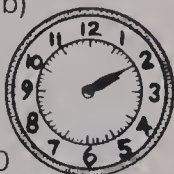
What time will it be in 10 min? Complete.

(a)



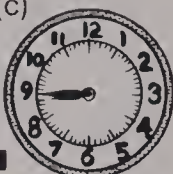
06:40

(b)



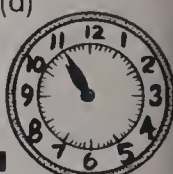
02:20

(c)



08:55

(d)



11:05

2. What time will it be in 20 min?  
(a) 07:30 07:50 (b) 03:10 03:30★ (c) 08:50 09:10★ (d) 09:55 10:15

3. How many minutes in a half hour? in a quarter hour? 15 min 30 min

★ 4. What time will it be in a half hour?  
(a) 06:30 07:00 (b) 08:15 08:45 (c) 12:05 12:35 (d) 03:20 03:50

★ 5. Ken ate breakfast at 08:15.  
One quarter hour later, he left for school.  
What time did he leave for school? 08:30

210 Time

Using the Book Discuss the display. Ask, "What does the display tell us?" Be sure they can see that there is a twenty-minute interval between the two clocks. If necessary, provide the child with a model clock to help in doing Exercises 1, 2, and 3.

# Minutes Before

Jackie arrived home at 03:50.  
She left school 15 min earlier.  
What time did she leave school?



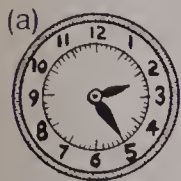
Arrived home



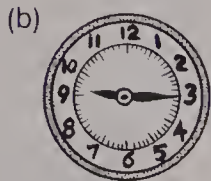
Left school

She left school at 03:■. 35

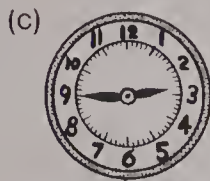
1. What time was it 10 min ago?



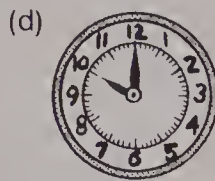
02 ■:15



09:■ 05

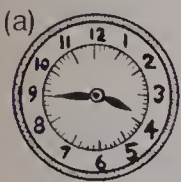


02 ●:■ 35

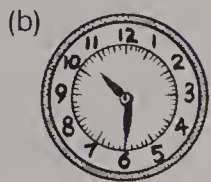


09 ●:■ 50

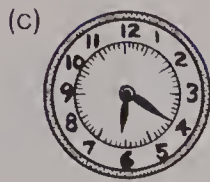
2. What time was it 20 min ago?



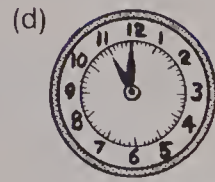
03:25



10:10

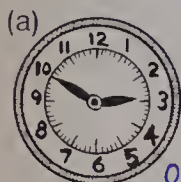


06:00

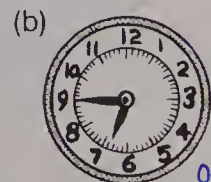


10:40

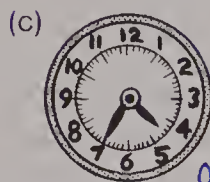
3. What time was it 30 min ago?



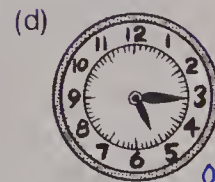
02:20



06:15



04:05



04:45

Time 211

**Using the Book** After discussing the display, assign Exercise 1(a). Move about the room to spot any problems. If there are no problems, direct the children to continue the exercises. If there are problems, reteach to those having the difficulties by using the procedure indicated in the Initial Activity.

## OBJECTIVE

To find the time some minutes earlier than a given time

## PACING

Level A All  
Level B All  
Level C All

## MATERIALS

demonstration clocks, duplicated clock faces without hands

## RELATED AIDS

HMS—DM61.

## SUGGESTIONS

**Initial Activity** Repeat the procedure used for page 210.

Janet ate breakfast at 08:20.

She got out of bed 35 min earlier.

What time did she get out of bed?

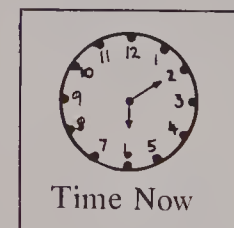
## ACTIVITIES

1. Modify Activity 1, page 210, in line with the "earlier than" objective.

2. Prepare a set of cards. Two players will play. Child selects one card from each pile. He shows the answer on the demonstration clock. His partner checks. Players reverse roles.

Time Cards

Activity Cards



Time Now

Washed dishes.  
Took 20 min.  
When did I start?

3. Challenge the children with exercises such as:

- It is 10:30. What time will it be 1 h 20 min from now?
- It is 02:45. What time was it 45 min ago?
- It is 08:30. How many hours and minutes is it until lunch at 12:00?



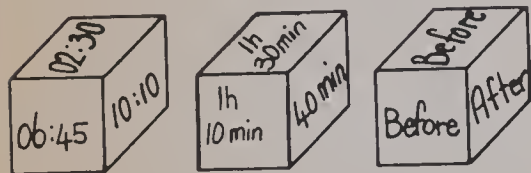
To practise solving word problems involving time

|         |     |
|---------|-----|
| Level A | 1-5 |
| Level B | 1-5 |
| Level C | All |

clock faces without hands

1. Use Activity 2 on page 211. Modify the Activity Cards to include “minutes earlier” and “minutes later” type activities.

2. Prepare 3 dice: one with times of day, one with hours and minutes, and one with "before" and "after". Children take turns rolling the 3 dice and must tell which time it "was" or "will be".



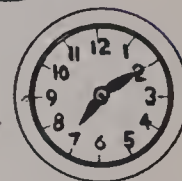
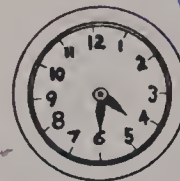
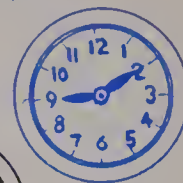
1. Jeff arrived for dinner at 06:35.  
He was one half hour late.  
What time did dinner start?
2. Class started at 09:15.  
Jim was one half hour late.  
What time did he arrive?
3. The circus started at 07:30.  
Bill and Jill were 20 min late.  
What time did they arrive?
4. The ball game started at 10:15.  
Harvey was 20 min early.  
What time did he arrive?

Draw clocks to tell the story.

1. Sylvia started gymnastics at 02:35.  
She finished 20 min later.  
When did she finish?
2. John started to boil an egg at 09:06.  
He boiled it 4 min.  
When was the egg finished?

Solve.

3. Jolynne finished skating at 04:30.  
She had skated 30 min.  
She started at  $\blacktriangle:\blacksquare$ . 04:00
4. A hockey game started at 08:00.  
The game finished 50 min later.  
The game finished at  $\blacktriangle:\blacksquare$ . 08:50
5. Milly started breakfast at 08:05.  
She finished 30 min later.  
What time did she finish? 08:35
6. Jeff arrived for dinner at 06:35.  
He was one half hour late.  
What time did dinner start? 06:05



How many kilograms is the pig?

**Using the Book** Do Exercise 1 as a class activity with children marking their own clock faces.

Assign the remaining questions.

The Braintickler will appeal to most children. Answers may vary due to the 6's and 9's, and the 15 or 1 and 5.



# A Bus Trip

Sue and Ron plan to visit their grandparents.



They made a schedule for their trip.

| Departure Time  | Travel Time | Arrival Time    |
|-----------------|-------------|-----------------|
| Calgary 09:10   | 30 min      | Carstairs 09:40 |
| Carstairs 10:00 | 25 min      | Olds 10:25      |
| Olds 10:45      | 35 min      | Bowden 11:20    |
| Bowden 11:30    | 45 min      | Red Deer 12:15  |

- Copy and complete the schedule Sue and Ron made.
- How long was the stop in Carstairs? Olds? Bowden?  
20 min 20 min 10 min
- How long was the trip from Olds to Bowden? from Bowden to Red Deer?  
35 min 45 min
- How many minutes was the bus travelling altogether — not counting the stops? 135 min
- How many hours and minutes after leaving Calgary did Sue and Ron arrive in Red Deer? 3 h 5 min
- Ron's cousin got on the bus at Olds. How long was his trip to Red Deer? 1 h 30 min

Time word problems 213

**Using the Book** Discuss the schedule by asking questions such as:

- When did the bus trip start? end?
- Give the names of the towns visited on the bus trip.
- What town was visited after Olds?
- What town was visited before Olds?
- What time did the bus arrive in Carstairs?
- How long was the trip from Olds to Bowden?
- How long was the stop in Olds?

When the class is familiar with the schedule, assign the exercises. Some children may wish to use the demonstration clocks to help them calculate the minutes.

## OBJECTIVE

To practise solving word problems involving time

## PACING

Level A All  
Level B All  
Level C All

## VOCABULARY

grandparents, schedule

## BACKGROUND

See Chapter Overview.

## ACTIVITIES

- Direct the children to make a picture story of a bus trip they would like to take. They would collect pictures to tell the story using a minimum number of sentences.
- Discuss a Bus Driver's job. What are his hours of work, the type of work (it's more than driving a bus!), place of work, people he would meet, how weather affects his job, and so on. Children may write a story on "One Day in the Life of a Bus Driver".
- Discuss proper ways to conduct oneself on a bus: rules for getting on, getting a seat, getting off, etc.
- Children may enjoy using maps to plan a trip by bus. They could create story problems based on their map work.

OBJECTIVE

To evaluate achievement of the chapter objectives

PACING

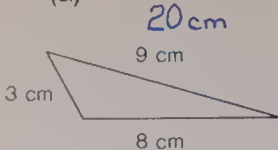
- Level A All
- Level B All
- Level C All

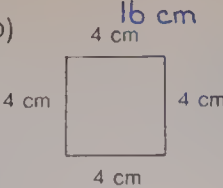
RELATED AIDS

HMS—DM1 and DM63.


Chapter Test

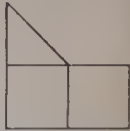
1. Find the perimeters.

(a)  20 cm

(b)  16 cm

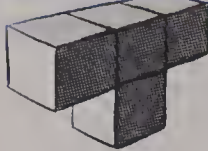
2. Find the areas in square centimetres.

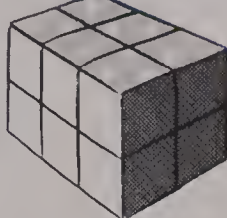
(a)  8 square centimetres

(b)  2.5 square centimetres

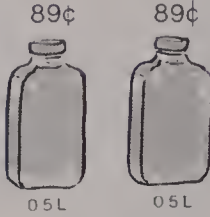
3. Find the volumes.


Each cube is a cubic centimetre.

(a)  4 cubic centimetres

(b)  12 cubic centimetres


4. Which is the better buy?

(a)  89¢ 0.5 L 89¢ 0.5 L

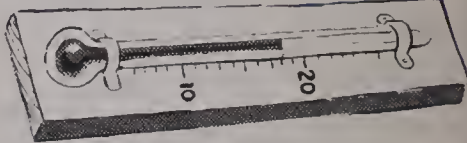
(b)  \$2.08 1 L

or


5. What time is it 15 min before this?

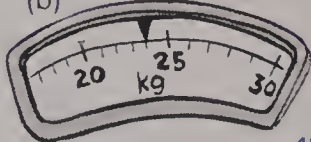
 04:20

6. Read the temperature.

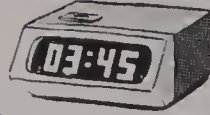
 18°C

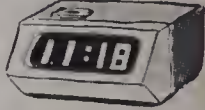
7. Read the scales:

(a)  to the nearest kilogram. 4 kg

(b)  to the nearest 10 kg. 20 kg

8. Write as: ■ minutes after ▲.

(a)  45 min after 3

(b)  18 min after 11

9. What is the date one week after January 5?

January 12

214 Chapter 7 test

**Using the Book** Each child should do this test independently under supervision. Assistance should be given only when the instructions are not understood. After the work has been corrected, you should provide appropriate remedial work. You may wish to reteach if a large number of children had difficulty with a particular topic or concept.

The following chart will help in this regard. The specific objectives are listed in the Chapter Overview (see page 188).

An alternate Chapter Test can be found in the Holt Mathematics System Duplicating Masters available for use with this grade level.

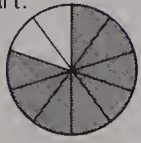
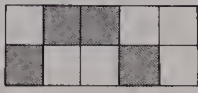
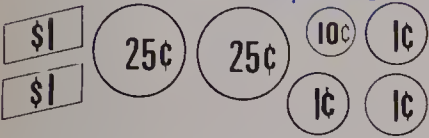
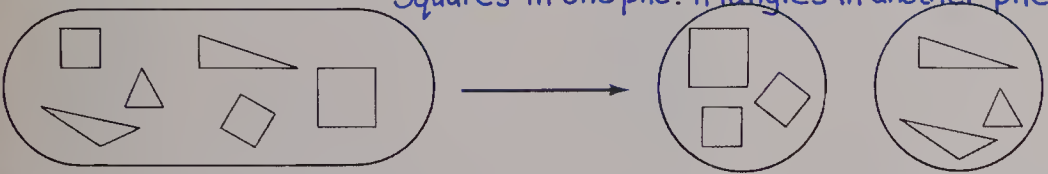
| Test Item | Objective | Text Page Number |
|-----------|-----------|------------------|
| 1-3       | A         | 190, 194, 198    |
| 4, 9      | D         | 200, 203         |
| 5         | C         | 211              |
| 6         | B         | 204              |
| 7         | B         | 201              |
| 8         | B         | 207              |

# Cumulative Review

## OBJECTIVE

To review and test selected concepts and skills previously covered

Complete.

1.  $\begin{array}{r} 2 \\ \times 3 \\ \hline 6 \end{array}$
2.  $\begin{array}{r} 3 \\ \times 4 \\ \hline 12 \end{array}$
3.  $\begin{array}{r} 5 \\ \times 5 \\ \hline 25 \end{array}$
4.  $\begin{array}{r} 4 \\ \times 0 \\ \hline 0 \end{array}$
5.  $\begin{array}{r} 3 \\ \times 1 \\ \hline 3 \end{array}$
6.  $8 \div 2 = \blacksquare$  4
7.  $10 \div 2 = \blacksquare$  5
8.  $12 \div 1 = \blacksquare$  12
9.  $20 \div 4 = \blacksquare$  5
10.  $\begin{array}{r} \$9.72 \\ + 6.69 \\ \hline \$16.41 \end{array}$
11.  $\begin{array}{r} 5.2 \\ + 6.4 \\ \hline 11.6 \end{array}$
12.  $\begin{array}{r} 6.3 \\ + 9.8 \\ \hline 16.1 \end{array}$
13.  $\begin{array}{r} 8.2 \\ - 1.7 \\ \hline 6.5 \end{array}$
14.  $\begin{array}{r} \$13.40 \\ - 2.36 \\ \hline \$11.04 \end{array}$
15. Name the fraction for the colored part.  
  $\frac{8}{10}$
16. Name the decimal for the colored part.  
 0.4
17. Add.  $\frac{2}{10} + \frac{3}{10} = \blacksquare$   $\frac{5}{10}$
18. How much money?  
 \$2.63
19. Mark paid the exact amount for a chocolate rabbit. It cost \$1.45. What bills and coins?  
\$1.00, 25¢, 10¢, 10¢
20. Name a rule for this sorting.  
 Squares in one pile. Triangles in another pile.
21. 5 Easter eggs in each basket. 3 baskets. How many Easter eggs? 15
22. 12 Easter eggs. 2 eggs put in each basket. How many baskets? 6

Chapters 1-7 cumulative review 215

**Using the Book** This page may be used for diagnostic and remedial as well as review purposes. Children should check their work, correct any errors, and review the pages that contain any problems of the type they missed. Some children can do this on their own while others may need help. If a large number of children have a particular problem incorrect, you may want to reteach that topic to the groups, then assign a duplicated worksheet to reinforce that topic or refer to an appropriate skill card in the BFA Computational Skills Kit I.

| Test Item | Text Page Number |
|-----------|------------------|
| 1         | 162              |
| 2         | 165              |
| 3         | 168              |
| 4         | 171              |
| 5         | 170              |
| 6, 7, 9   | 178              |
| 8         | 181              |
| 10        | 145              |
| 11, 12    | 133              |
| 13        | 134              |
| 14        | 146              |
| 15        | 129              |
| 16        | 130              |
| 17        | 133              |
| 18, 19    | 148              |
| 20        | 96               |
| 21        | 174              |
| 22        | 183              |



# CHAPTER 8 OVERVIEW

This chapter extends the basic work on multiplication and division introduced in Chapter 6.

## OBJECTIVES

- A To review the meaning of multiplication and division
- B To introduce multiplying by 10
- C To introduce dividing by 10
- D To introduce the division sign  $\overline{)}$
- E To introduce dividing zero
- F To solve word problems

## BACKGROUND

See Overview for Chapter 6 for general details. In this chapter, work should be continued, through the use of arrays, to connect the pictorial and abstract stages.

## MATERIALS

variety of concrete materials as outlined for each lesson  
array boards  
large elastics  
graph paper

## CAREER AWARENESS

### Factory Worker [241]

A worker in factories would need a good background in measurement, shapes, prices, and computation. Awareness of details, the ability to interpret a pattern, and a co-operative nature would also be helpful in this particular kind of job. Most factory workers learn their work through on-the-job training.

Since some factories work twenty-four hours a day, some workers may be required to work shifts.

# Multiplication and Division

What is **multiplication**?



6 groups of 2

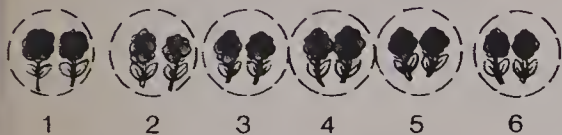


2 on each plant.

$\times 6$  plants.

$6 \times 2 = 12$  flowers altogether.

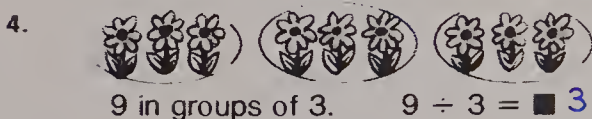
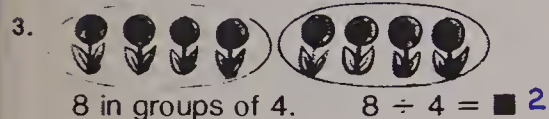
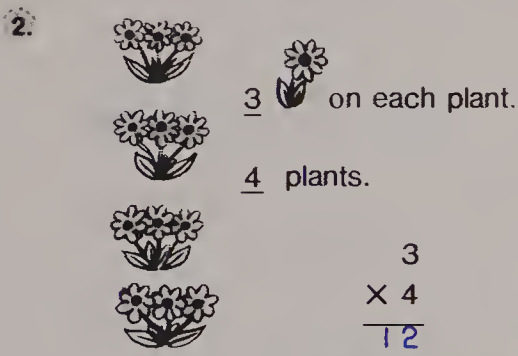
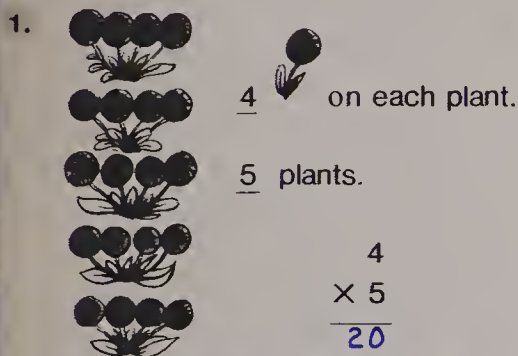
What is **division**?



12 flowers.  
Groups of 2.

12 in groups of 2.

$12 \div 2 = 6$  groups of 2.



Meaning of multiplication and division 217

**Using the Book** In order to answer the question, "What is multiplication?", draw the children's attention to the artwork. Ask, "How many plants are there? (6)" "How many flowers are on each plant? (2)" "How many flowers are there in all? (12)" "What is the multiplication story to go with this? ( $6 \times 2 = 12$  or  $2 \times 6 = 12$ )"

Emphasize to the children that multiplication (a) is like repeated addition, (b) is quicker and easier than repeated addition, and (c) involves "putting together" or "joining" of sets.

Have the children focus attention on the artwork and the question, "What is division?" Ask, "How many groups of flowers do we have? (6)" "How many flowers are in each group? (2)" "How many groups of flowers do we have? (6)" "What division story can be written to go with this? ( $12 \div 2 = 6$ )" Emphasize that division involves "sharing" or "breaking up" of sets. Point out that multiplication and division are the opposite of one another. In their workbooks the children should answer the appropriate number sentences by filling in blanks.

## OBJECTIVE

To review the meaning of multiplication and division

## PACING

Level A All  
Level B All  
Level C All

## MATERIALS

counters

## BACKGROUND

Now that the children have been introduced to multiplication and division in Chapter 6, it is important to emphasize the relationship between multiplication and division.

## SUGGESTIONS

**Initial Activity** Refer to the teaching suggestions in Chapter 6, pages 157 and 175 for basic ideas to review with children that (a) multiplication is really the same as repeated addition, (b) division means "equal sharing", and (c) these two operations are the opposite or inverse of one another.

Additional material emphasizing the relatedness of these two operations is located on pages 179 and 180 (Related Stories).

## ACTIVITIES

1. Have the children make "arrays" with their counters, draw each array, and record the multiplication and division stories.

2. Give children three numbers, i.e., 12, 4, 3. Have children dramatize (a) a multiplication story and (b) a division story using the numbers given.

3. Use catalogue/magazine cutouts to make arrays for stated problems, i.e.,  $8 \div 4 = 2$  or  $5 \times 1 = 5$ .

## OBJECTIVE

To reinforce the relation of multiplication and division

## PACING

Level A All  
Level B All  
Level C All

## MATERIALS

counters, elastic bands, overhead projector, graph paper

## BACKGROUND

It should be emphasized that division is the inverse or "undoing" of multiplication and that the children can use their knowledge of multiplication facts to help with division facts.

## SUGGESTIONS

**Initial Activity** The introductory page (page 176 in the Teacher's Edition for Chapter 6) presented the initial experiences in showing the relationship between multiplication and division.

Use the overhead projector and elastic bands to isolate sets of counters, and have the children tell the multiplication and related division stories that are represented. Record these as a group.

Do several examples with the children before referring to the textbook.

## ACTIVITIES

1. Have the children use graph paper and cut out arrays to illustrate basic facts. They should record the appropriate related multiplication and division stories under each array.

2. Have the children draw an array using their favourite animals. Use with a partner who gives (a) a multiplication story and (b) a division story to accompany the array.

3. Prepare cards.

These are related stories:

- (a)  $3 \times 4 = 12$   $12 \div 3 = 4$  Yes No  
(b)  $2 \times 1 = 2$   $12 \div 2 = 6$  Yes No  
(c)  $4 \times 0 = 0$   $4 \div 4 = 1$  Yes No

## Multiplication and Division



There are 15 flowers.

We will put 5 flowers in each vase.

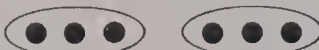
We will need 3 vases.





Multiplication Story: 3 groups of 5.  
 $3 \times 5 = 15$

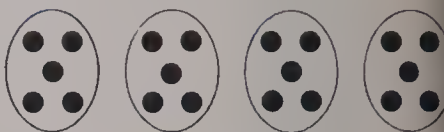
Division Story: 15 in groups of 5.  
 $15 \div 5 = 3$


Write a division story that goes with each of these.


1.   
 $2 \times 3 = 6$   
 $6 \div 3 = 2$

2.   
 $3 \times 4 = 12$   
 $12 \div 4 = 3$

3.   
 $4 \times 3 = 12$   
 $12 \div 3 = 4$

4.   
 $4 \times 5 = 20$   
 $20 \div 5 = 4$

5.   
 $4 \times 2 = 8$   
 $8 \div 2 = 4$

6.   
 $4 \times 4 = 16$   
 $16 \div 4 = 4$

218 Relating multiplication and division

**Using the Book** Focus attention on the artwork at the top of page 218. Ask, "How many flowers are there in all? (15)" "How many flowers are in each group? (5)" "How many groups are there? (3)" "What is the multiplication story we can write for this? ( $3 \times 5 = 15$ )" "What is the division story we can write for this? ( $15 \div 5 = 3$ )" Emphasize to children the relationship between multiplication and division (division is the "undoing" of multiplication).

Assign the two pages. Have the children copy the number stories into their books filling in the  $\blacksquare$  for Exercises 1-12. Children may verify their answers for Exercises 1 and 7 in the back of the book.

In Exercises 13 and 14 children should show their understanding of concept by giving related number stories. Exercises 13(a) and 14(a) may be verified by children.



Write a multiplication story for each of these.

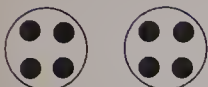
7.



$$6 \div 2 = 3$$

$$\begin{array}{c} \blacksquare \times \blacksquare = \blacksquare \\ 3 \times 2 = 6 \end{array}$$

9.



$$8 \div 4 = 2$$

$$\begin{array}{c} \blacksquare \times \blacksquare = \blacksquare \\ 2 \times 4 = 8 \end{array}$$

11.



$$9 \div 3 = 3$$

$$\begin{array}{c} \blacksquare \times \blacksquare = \blacksquare \\ 3 \times 3 = 9 \end{array}$$

8.



$$15 \div 3 = 5$$

$$\begin{array}{c} \blacksquare \times \blacksquare = \blacksquare \\ 5 \times 3 = 15 \end{array}$$

10.



$$15 \div 5 = 3$$

$$\begin{array}{c} \blacksquare \times \blacksquare = \blacksquare \\ 3 \times 5 = 15 \end{array}$$

12.



$$7 \div 1 = 7$$

$$\begin{array}{c} \blacksquare \times \blacksquare = \blacksquare \\ 7 \times 1 = 7 \end{array}$$

Draw arrays if you need to.

13. Write a related division sentence.

- (a)  $5 \times 2 = 10$   $10 \div 2 = 5$  (b)  $4 \times 3 = 12$   $12 \div 3 = 4$  (c)  $3 \times 3 = 9$   $9 \div 3 = 3$   
 (d)  $4 \times 5 = 20$   $20 \div 5 = 4$  (e)  $3 \times 5 = 15$   $15 \div 5 = 3$  (f)  $4 \times 4 = 16$   $16 \div 4 = 4$

14. Write a related multiplication sentence.

- (a)  $15 \div 5 = 3$   $3 \times 5 = 15$  (b)  $10 \div 2 = 5$   $5 \times 2 = 10$  (c)  $12 \div 3 = 4$   $4 \times 3 = 12$   
 (d)  $16 \div 4 = 4$   $4 \times 4 = 16$  (e)  $8 \div 2 = 4$   $4 \times 2 = 8$  (f)  $15 \div 3 = 5$   $5 \times 3 = 15$

## OBJECTIVE

To review and extend multiplying by 2 and 3 up to  $2 \times 10$  and  $3 \times 10$

## PACING

Level A All  
Level B All  
Level C All

## MATERIALS

counters, egg carton

## SUGGESTIONS

**Initial Activity** Review counting by 2's and 3's.

Cut off the last 2 sections of an egg carton so that you now have 10 sections. Place 2 counters in each section and discuss the number of counters in "4 sections, 10 sections, 6 sections, and so on". Emphasize that sections represent "sets of 2". Have the children record the multiplication stories.

*Example*



$$5 \times 2 = 10$$

Repeat the procedure using 3 counters in each section.

Emphasize how counting by 2's and 3's can help with multiplication facts.

## ACTIVITIES

1. Have the children use a 10-section egg carton and counters to make all the multiplication stories systematically for multiplying by 2 and 3 up to  $2 \times 10$  and  $3 \times 10$ .

*Example*

$$\begin{aligned} 1 \times 2 &= \\ 2 \times 2 &= \\ \text{etc.} \end{aligned}$$

2. Use the "Missing Numbers" game in the Activity Reservoir. Modify to match the skills in this section.

3. Give children a time limit, i.e., 15 s (use a timer). Have children give as many multiplication facts as possible with 2 as a factor. Child who gives the most facts is the winner. (This activity can be repeated with 3 as a factor.)

## Multiplying by 2 and 3

1. Count by 2's to 20. Write the numbers. 2, 4, 6, 8, 10, 12, 14, 16, 18, 20



3 branches. 2 leaves on each.

3 groups of 2  $\rightarrow 3 \times 2 = 6$  leaves.

Copy and complete.

- |                                    |                                       |                                       |
|------------------------------------|---------------------------------------|---------------------------------------|
| 2. $5 \times 2 = \blacksquare 10$  | 3. $8 \times 2 = \blacksquare 16$     | 4. $4 \times 2 = \blacksquare 8$      |
| 5. $9 \times 2 = \blacksquare 18$  | 6. $7 \times 2 = \blacksquare 14$     | 7. $3 \times 2 = \blacksquare 6$      |
| 8. $10 \times 2 = \blacksquare 20$ | 9. $6 \times 2 = \blacksquare 12$     | 10. $2 \times 2 = \blacksquare 4$     |
| 11. $1 \times 2 = \blacksquare 2$  | ★ 12. $11 \times 2 = \blacksquare 22$ | ★ 13. $12 \times 2 = \blacksquare 24$ |

14. Count by 3's to 30. Write the numbers. 3, 6, 9, 12, 15, 18, 21, 24, 27, 30



4 groups of 3  $\rightarrow 4 \times 3 = 12$  leaves.

Copy and complete.

- |                                    |                                    |                                     |
|------------------------------------|------------------------------------|-------------------------------------|
| 15. $2 \times 3 = \blacksquare 6$  | 16. $8 \times 3 = \blacksquare 24$ | 17. $5 \times 3 = \blacksquare 15$  |
| 18. $6 \times 3 = \blacksquare 18$ | 19. $7 \times 3 = \blacksquare 21$ | 20. $10 \times 3 = \blacksquare 30$ |
| 21. $3 \times 3 = \blacksquare 9$  | 22. $9 \times 3 = \blacksquare 27$ | 23. $4 \times 3 = \blacksquare 12$  |

220 Multiplying by 2 and 3 up to  $2 \times 10$ ,  $3 \times 10$

**Using the Book** Children are to work independently on the assigned questions by filling in each  $\blacksquare$  for each multiplication story.

In Exercises 1 and 14 the artwork will assist those who are needing help in counting by 2's and 3's.

# Multiplying by 4

1. Count by 4's to 40. Write the numbers. 4, 8, 12, 16, 20, 24, 28, 32, 36, 40



5 groups of 4  $\longrightarrow$   $5 \times 4 = 20$  leaves.

Write multiplication stories for 4.

$8 \times 4 = \blacksquare$  32

$7 \times 4 = \blacksquare$  28

$5 \times 4 = \blacksquare$  20

$6 \times 4 = \blacksquare$  24

$10 \times 4 = \blacksquare$  40

$9 \times 4 = \blacksquare$  36

Copy and complete.

- |                                     |                                    |                                    |
|-------------------------------------|------------------------------------|------------------------------------|
| 2. $2 \times 4 = \blacksquare$ 8    | 9. $6 \times 4 = \blacksquare$ 24  | 10. $5 \times 4 = \blacksquare$ 20 |
| 11. $10 \times 4 = \blacksquare$ 40 | 12. $4 \times 4 = \blacksquare$ 16 | 13. $9 \times 4 = \blacksquare$ 36 |
| 14. $3 \times 4 = \blacksquare$ 12  | 15. $8 \times 4 = \blacksquare$ 32 | 16. $7 \times 4 = \blacksquare$ 28 |

Multiplying by 4 up to  $4 \times 10$  221

**Using the Book** Children are to work on this page using the same format as previous page.

## OBJECTIVE

To review and extend multiplying by 4 up to  $4 \times 10$

## PACING

Level A All  
Level B All  
Level C All

## MATERIALS

counters, egg cartons (from page 220), graph paper

## RELATED AIDS

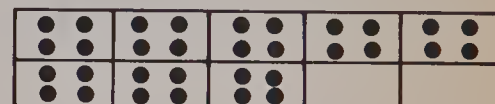
BFA COMP LAB I—90.

## SUGGESTIONS

**Initial Activity** Review counting by 4's up to 40. Using the 10-section egg cartons from the previous page, place 4 counters in each section and discuss the number of counters in "3 sections, 10 sections, and so on".

Have the children record the multiplication stories with multiplying by 4.

*Example*



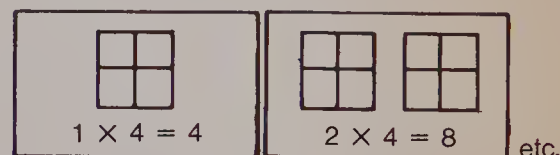
$$8 \times 4 = 32$$

Do several examples with the children before assigning the page.

## ACTIVITIES

1. Have the children cut out sets of 4 squares from graph paper and make a booklet on multiplying by 4 up to  $4 \times 10$ .

*Example*



2. Use "The Multiplication Game" and/or "The Facts Machine" game in the Activity Reservoir. Modify to match the skills in this section.

3. Have the children solve this problem. (This can be used for several facts.) "The product is 27. One factor is 6 more than the other factor. What are the factors? (9, 3)"

|          |               |        |
|----------|---------------|--------|
| <u>3</u> | <u>2 more</u> | (3, 1) |
| <u>6</u> | <u>1 more</u> | (3, 2) |



## OBJECTIVE

To review and reinforce the concept of sharing

## PACING

Level A All  
Level B All  
Level C All

## VOCABULARY

sharing, jelly beans, date squares, doughnuts, wieners, marshmallows, among

## SUGGESTIONS

**Initial Activity** Have the children use concrete materials to demonstrate sharing activities similar to those in the display at the top of the page.

Use array patterns to illustrate the situations.

Demonstrations that can be eaten are particularly useful in raising interest, motivating and in setting a positive tone in the class.

## ACTIVITIES

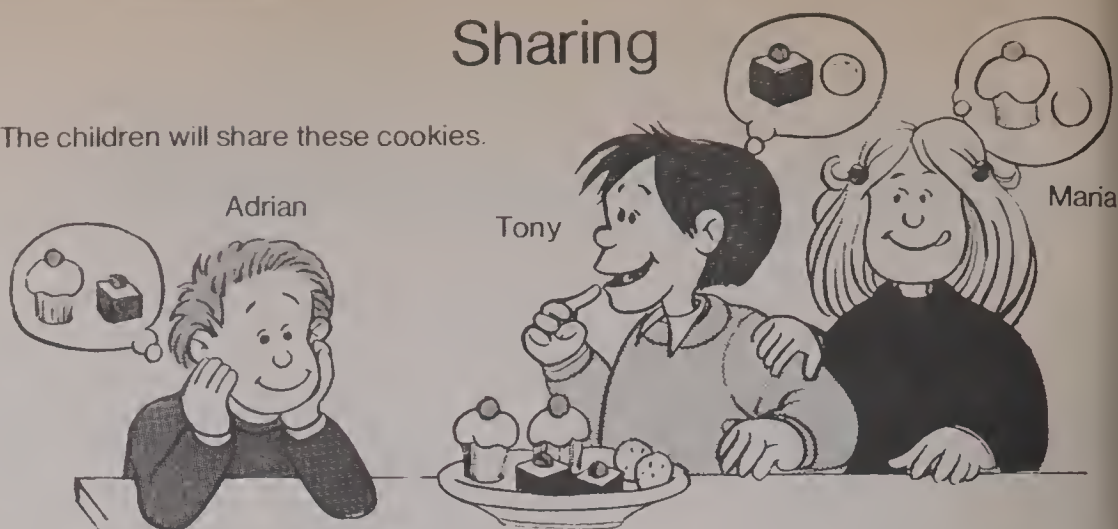
1. Have the children make up "sharing problems" to share with a friend.

2. Set up a sharing centre (i.e., for comic books). Children bring comic books from home and place in centre and in turn share someone else's comic books.

3. Teacher sets up jelly beans in a jar for one week. Guess how many! Closest guess (winner) gets to share jelly beans with class. Distribute quickly by giving two per person at each recess until done. (If you have 30 pupils place an amount of jelly beans that can be equally shared, i.e., 150.)

## Sharing

The children will share these cookies.



1. There were 4 children. Each had 5 jelly beans. How many jelly beans in all? **20**
2. There are 15 marbles. Adrian, Tony, and Maria will share. How many will Tony get? **5**
3. There are 12 date squares. There are 4 children. How many squares each? **3**
4. Eighteen wieners are shared among nine children. How many wieners each? **2**
5. Twenty-five doughnuts are shared among five boys. How many doughnuts each? **5**
6. There are 24 marshmallows to be shared among four boys. How many marshmallows each? **6**

7.  $8 \div 4 = \blacksquare$  **2**
8.  $12 \div 3 = \blacksquare$  **4**
9.  $10 \div 2 = \blacksquare$  **5**
10.  $16 \div 4 = \blacksquare$  **4**
11.  $9 \div 1 = \blacksquare$  **9**
12.  $20 \div 4 = \blacksquare$  **5**
13.  $9 \div 3 = \blacksquare$  **3**
14.  $12 \div 4 = \blacksquare$  **3**
15.  $15 \div 3 = \blacksquare$  **5**
16.  $8 \div 4 = \blacksquare$  **2**
17.  $2 \div 2 = \blacksquare$  **1**
18.  $4 \div 4 = \blacksquare$  **1**

222 Sharing

**Using the Book** Have children observe the artwork at the top of the page. Ask, "How many treats are on the plate? (6)" "How many children wish to share them? (3)" "How can we make sure each child gets equal amounts. (divide, share evenly)" "How many treats does each child get? (2)" "What division story can we write to show this? ( $6 \div 3 = 2$ )"

Work through the "trick" problem, Exercise 1, together. Emphasize this is "groups of" not "groups into". Verify answer in the back of the book. Tell children that this shows *again* related stories of multiplication and division.

Exercises 2-6 should be answered by children supplying the division story for each question.

Children copy Exercises 7-18 into their workbooks giving answers for each  $\blacksquare$ .

# Multiplying by 5

1. Count by 5's to 50. Write the numbers. **5, 10, 15, 20, 25, 30, 35, 40, 45, 50**



4 groups of 5  $\longrightarrow$   $4 \times 5 = 20$  fingers.

Write multiplication stories for 5.



$8 \times 5 = \blacksquare 40$

4.



$5 \times 5 = 25$

5.



$6 \times 5 = 30$



$9 \times 5 = 45$

|   |   |  |  |   |
|---|---|--|--|---|
| 6. $\begin{array}{r} 7 \\ \times 5 \\ \hline 35 \end{array}$  | 7. $\begin{array}{r} 5 \\ \times 5 \\ \hline 25 \end{array}$  | 8. $\begin{array}{r} 9 \\ \times 5 \\ \hline 45 \end{array}$   | 9. $\begin{array}{r} 6 \\ \times 5 \\ \hline 30 \end{array}$ | 10. $\begin{array}{r} 2 \\ \times 5 \\ \hline 10 \end{array}$ |
| 11. $\begin{array}{r} 8 \\ \times 5 \\ \hline 40 \end{array}$ | 12. $\begin{array}{r} 3 \\ \times 5 \\ \hline 15 \end{array}$ | 13. $\begin{array}{r} 10 \\ \times 5 \\ \hline 50 \end{array}$ | 14. $\begin{array}{r} 1 \\ \times 5 \\ \hline 5 \end{array}$ | 15. $\begin{array}{r} 0 \\ \times 5 \\ \hline 0 \end{array}$  |

Multiplying by 5 up to  $5 \times 10$  **223**

**Using the Book** Tell children this page is for independent work. (The artwork will help those who need it, to count to 50 by 5's.)

The children are to fill in the blanks or give their own number stories for the questions.

3. Make up sets of 5 graphs. Children could colour squared paper in groups of 5 and write an accompanying multiplication story.



## OBJECTIVE

To review and extend multiplying by 5 up to  $5 \times 10$

## PACING

Level A All  
Level B All  
Level C All

## MATERIALS

toothpicks, elastic bands, graph paper, nickels

## RELATED AIDS

BFA COMP LAB I—91.

## SUGGESTIONS

**Initial Activity** Review counting by 5's up to 50. Bundle groups of 5 toothpicks and secure with an elastic band. Select a number of bundles and have the children tell how many toothpicks and give the corresponding multiplication story.

*Example*



$8 \times 5 = 40$

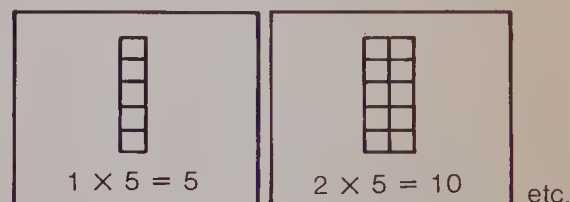
Use nickels. Take a handful. Guess how many and then use multiplying by 5 to find out how many.

Emphasize how counting by 5's can help with multiplication facts.

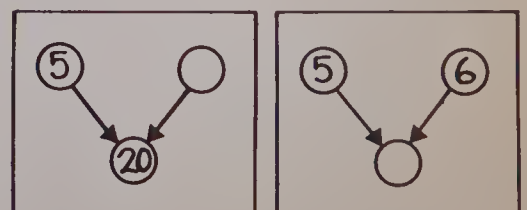
## ACTIVITIES

1. Have the children make a booklet of multiplying by 5 using graph paper to make arrays and record the multiplication stories below.

*Example*



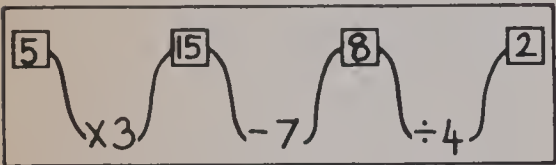
2. Set up cards. The children are to find the missing numbers for the  $\times 5$  facts.



**OBJECTIVE**  
To provide practice in multiplication

**PACING**  
Level A All  
Level B All  
Level C Odd-numbered exercises

**ACTIVITIES**  
1. Use the "Patchwork Quilt" game in the Activity Reservoir. Modify to match the skills in this section.  
2. Prepare cards for children.  
*Example*

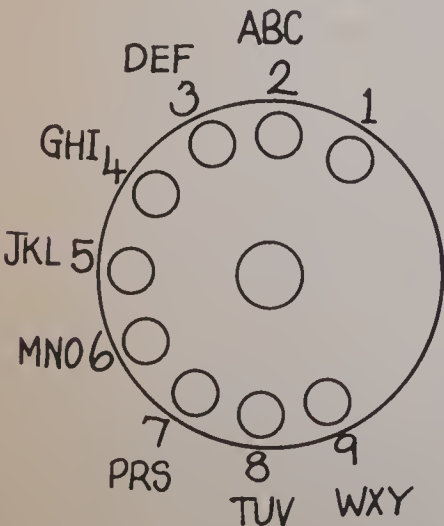


3. Give printed sheets in square form. Number the squares 1 to 25. Supply questions.  
 $6 + 2$  — Children colour 8 in.  
 $5 \times 3$  — Children colour 15 in.  
 $1 \div 1$  — Children colour 1 in.

|    |    |    |    |    |
|----|----|----|----|----|
| 1  | 2  | 3  | 4  | 5  |
| 6  | 7  | 8  | 9  | 10 |
| 11 | 12 | 13 | 14 | 15 |
| 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 |

4. *Telephone Dial*  
Prepare cards and have children give answers in each .  
*Example*

$A \times I = \boxed{8}$   
 $W \div F = \boxed{3}$



**Tune Up**

1.  $4 \times 1 = \blacksquare 4$  2.  $2 \times 4 = \blacksquare 8$  3.  $5 \times 3 = \blacksquare 15$  4.  $4 \times 3 = \blacksquare 12$   
5.  $1 \times 3 = \blacksquare 3$  6.  $4 \times 5 = \blacksquare 20$  7.  $2 \times 2 = \blacksquare 4$  8.  $1 \times 8 = \blacksquare 8$   
9.  $0 \times 5 = \blacksquare 0$  10.  $1 \times 5 = \blacksquare 5$  11.  $3 \times 2 = \blacksquare 6$  12.  $9 \times 2 = \blacksquare 18$

|   |   |   |   |   |   |
|---|---|---|---|---|---|
| 13. $\begin{array}{r} 0 \\ \times 4 \\ \hline 0 \end{array}$  | 14. $\begin{array}{r} 4 \\ \times 6 \\ \hline 24 \end{array}$ | 15. $\begin{array}{r} 3 \\ \times 6 \\ \hline 18 \end{array}$ | 16. $\begin{array}{r} 1 \\ \times 5 \\ \hline 5 \end{array}$  | 17. $\begin{array}{r} 4 \\ \times 9 \\ \hline 36 \end{array}$ | 18. $\begin{array}{r} 3 \\ \times 4 \\ \hline 12 \end{array}$ |
| 19. $\begin{array}{r} 4 \\ \times 8 \\ \hline 32 \end{array}$ | 20. $\begin{array}{r} 5 \\ \times 5 \\ \hline 25 \end{array}$ | 21. $\begin{array}{r} 2 \\ \times 6 \\ \hline 12 \end{array}$ | 22. $\begin{array}{r} 3 \\ \times 8 \\ \hline 24 \end{array}$ | 23. $\begin{array}{r} 5 \\ \times 4 \\ \hline 20 \end{array}$ | 24. $\begin{array}{r} 2 \\ \times 8 \\ \hline 16 \end{array}$ |
| 25. $\begin{array}{r} 5 \\ \times 7 \\ \hline 35 \end{array}$ | 26. $\begin{array}{r} 3 \\ \times 7 \\ \hline 21 \end{array}$ | 27. $\begin{array}{r} 4 \\ \times 7 \\ \hline 28 \end{array}$ | 28. $\begin{array}{r} 1 \\ \times 8 \\ \hline 8 \end{array}$  | 29. $\begin{array}{r} 2 \\ \times 7 \\ \hline 14 \end{array}$ | 30. $\begin{array}{r} 1 \\ \times 7 \\ \hline 7 \end{array}$  |
| 31. $\begin{array}{r} 3 \\ \times 9 \\ \hline 27 \end{array}$ | 32. $\begin{array}{r} 5 \\ \times 8 \\ \hline 40 \end{array}$ | 33. $\begin{array}{r} 3 \\ \times 1 \\ \hline 3 \end{array}$  | 34. $\begin{array}{r} 1 \\ \times 6 \\ \hline 6 \end{array}$  | 35. $\begin{array}{r} 2 \\ \times 5 \\ \hline 10 \end{array}$ | 36. $\begin{array}{r} 1 \\ \times 4 \\ \hline 4 \end{array}$  |
| 37. $\begin{array}{r} 5 \\ \times 2 \\ \hline 10 \end{array}$ | 38. $\begin{array}{r} 0 \\ \times 6 \\ \hline 0 \end{array}$  | 39. $\begin{array}{r} 0 \\ \times 9 \\ \hline 0 \end{array}$  | 40. $\begin{array}{r} 3 \\ \times 3 \\ \hline 9 \end{array}$  | 41. $\begin{array}{r} 4 \\ \times 4 \\ \hline 16 \end{array}$ | 42. $\begin{array}{r} 2 \\ \times 9 \\ \hline 18 \end{array}$ |

224 Practice

**Using the Book** Tell the children to work independently giving the appropriate answers to the multiplication questions.



# Multiplying by 10

1. Count by 10's to 100. Write the numerals. *10, 20, 30, 40, 50, 60, 70, 80, 90, 100*



6 groups of 10  $\longrightarrow$   $6 \times 10 = 60$  sticks.

Write the multiplication stories for 10.

2.



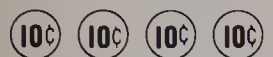
$$3 \times 10 = \blacksquare 30$$

3.



$$\begin{array}{r} 5 \\ \blacksquare \times \blacksquare = \blacksquare \end{array}$$

4.



$$\begin{array}{r} 4 \\ \blacksquare \times \blacksquare = \blacksquare \end{array}$$

5.



$$\begin{array}{r} 6 \\ \blacksquare \times \blacksquare = \blacksquare \end{array}$$

Copy and complete.

|  |  |  |  |  |  |
|--|--|--|--|--|--|
| 6. $\begin{array}{r} 10 \\ \times 8 \\ \hline 80 \end{array}$  | 7. $\begin{array}{r} 10 \\ \times 5 \\ \hline 50 \end{array}$  | 8. $\begin{array}{r} 9 \\ \times 10 \\ \hline 90 \end{array}$  | 9. $\begin{array}{r} 6 \\ \times 10 \\ \hline 60 \end{array}$  | 10. $\begin{array}{r} 7 \\ \times 10 \\ \hline 70 \end{array}$ | 11. $\begin{array}{r} 10 \\ \times 9 \\ \hline 90 \end{array}$   |
| 12. $\begin{array}{r} 10 \\ \times 4 \\ \hline 40 \end{array}$ | 13. $\begin{array}{r} 3 \\ \times 10 \\ \hline 30 \end{array}$ | 14. $\begin{array}{r} 2 \\ \times 10 \\ \hline 20 \end{array}$ | 15. $\begin{array}{r} 1 \\ \times 10 \\ \hline 10 \end{array}$ | 16. $\begin{array}{r} 0 \\ \times 10 \\ \hline 0 \end{array}$  | 17. $\begin{array}{r} 10 \\ \times 10 \\ \hline 100 \end{array}$ |

Multiplying by 10 up to  $10 \times 10$  225

**Using the Book** Assign the page to be done independently in the children's workbooks. Artwork will assist those who need help in counting. Also point out the illustrated multiplication story  $6 \times 10$ .

3. Play tic-tac-toe. Multiply the number in the space by 10 before placing an  $\times$  or O in that space.

|   |   |   |
|---|---|---|
| 4 | 6 | 2 |
| 3 | 8 | 5 |
| 7 | 1 | 9 |

## OBJECTIVE

To write multiplication stories when multiplying by 10 up to  $10 \times 10$

## PACING

Level A All  
Level B All  
Level C All

## MATERIALS

graph paper, dimes, bundles of sticks (in 10's)

## RELATED AIDS

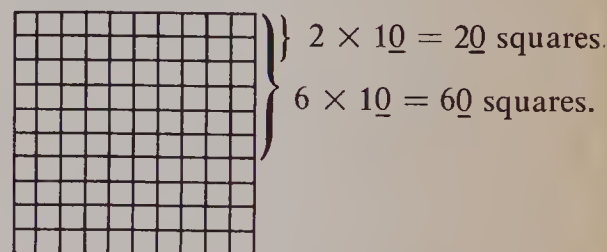
HMS—DM64.  
BFA COMP LAB I—96.

## SUGGESTIONS

**Initial Activity** Review the basic concepts of place value — the children will use this to help them see the patterning in multiplying by 10.

Cut graph paper to form a 10 by 10 grid. The children can now use this to show the different multiplication facts when multiplying by 10.

*Example*



Emphasize the use of place value as illustrated above ( $6 \times 10 \longrightarrow 60$ ).

Question the children about the patterns they may see.

## ACTIVITIES

- Have the children cut graph paper and make a book about multiplying by 10.
- Have children complete the chart.

|   | Number of People | Number of Fingers |
|---|------------------|-------------------|
| H | 1                | 10                |
| O | 2                | 20                |
| W | 3                |                   |
|   | 4                |                   |
| M | 5                |                   |
| A | 6                |                   |
| N | etc.             |                   |
| Y |                  |                   |

## OBJECTIVE

To solve word problems using multiplication

## PACING

Level A All  
Level B All  
Level C All

## MATERIALS

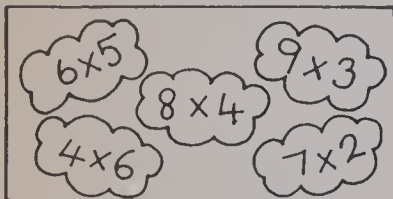
variety of concrete materials, overhead projector

## SUGGESTIONS

**Initial Activity** Do several examples similar to those on the page using the overhead projector and concrete materials to illustrate "mysteries". Be certain children have ample opportunity to observe and take part in the steps of successful problem-solving (page 202) and the recording of answers.

## ACTIVITIES

1. Make cards.



Choose 3 number stories and draw arrays to match.

2. Have children set up story problems using any/all of these facts.  $4 \times 9$ ,  $5 \times 7$ ,  $9 \times 2$ ,  $3 \times 8$ , etc.

3. Have the children make up and exchange word problems with a friend.

## More Mysteries

Draw arrays if you need to.

1. Three branches have four apples on each branch.  
How many apples are there?

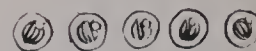
$$3 \times 4 = \blacksquare \quad 12$$



2. Mary planted 4 seeds in each pot.  
She planted seeds in 6 pots.  
How many seeds did she plant? 24



3. Tom has 5 different colors of marbles.  
He has 10 of each color.  
How many marbles does he have? 50



4. There were 2 leaves on the ground.  
Each leaf has 7 bugs on it.  
How many bugs are there? 14



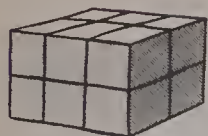
5. Five caterpillars were eating leaves.  
Each one ate 6 leaves.  
How many leaves did they eat? 30



**Using the Book** Instruct children to answer the questions in their workbooks. Tell them to use the artwork as a guide for solving the problems. In these questions, we are working with larger numbers and some children may need to draw diagrams to help them solve the problems; if this is the case, encourage them to draw arrays to represent the story problem.

# Multiplying and Dividing

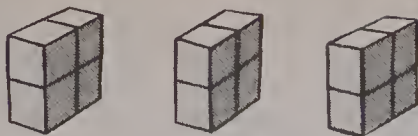
Multiplication



3 groups of 4.

$$3 \times 4 = 12 \text{ boxes.}$$

Division



12 grouped in groups of 4.

$$12 \div 4 = 3 \text{ groups.}$$

or

Multiplication puts groups together.

Division takes groups apart.



There are 10 blocks.

There are 2 in each group.

There are 5 groups.

We write a division story like this:

$$10 \div 2 = 5$$

or

in a new way

$$\begin{array}{r} 5 \\ 2 \overline{)10} \end{array}$$

Write division stories the "new" way.

1.  $8 \div 2 = \blacksquare$   $2 \overline{)8}$
2.  $6 \div 3 = \blacksquare$   $3 \overline{)6}$
3.  $4 \div 1 = \blacksquare$   $1 \overline{)4}$
4.  $12 \div 4 = \blacksquare$   $4 \overline{)12}$
5.  $15 \div 3 = \blacksquare$   $3 \overline{)15}$
6.  $9 \div 3 = \blacksquare$   $3 \overline{)9}$
7.  $20 \div 5 = \blacksquare$   $5 \overline{)20}$
8.  $25 \div 5 = \blacksquare$   $5 \overline{)25}$
9.  $16 \div 4 = \blacksquare$   $4 \overline{)16}$

Inverses and division sign 227

**Using the Book** Focus the children's attention on the artwork at the top of the page. Ask, "How many boxes in a group? (4)" "How many groups of boxes? (3)" "How many boxes altogether? (12)" "What multiplication story can we write to go with this? ( $3 \times 4 = 12$ )" Tell children "Multiplication puts groups of things together."

Observe the artwork on the right-hand side of the page. Ask, "How many boxes are there altogether? (12)" "How many groups are the boxes in? (3)" "How many boxes are in each group? (4)" "What division story can we write to go with this? ( $12 \div 4 = 3$ )" Tell children "Division takes groups of things apart."

Write the two rules of multiplication and division on separate strips of paper and post in the room.

Draw attention to the artwork in the centre of the page. Ask, "How many blocks are there in all? (10)" "How many blocks are in each group? (2)" "How many groups are there? (5)" "What division problem would we write to go with this? ( $10 \div 2 = 5$ )" Tell the children that the story  $10 \div 2 = 5$  can be written

in a new way:  $\begin{array}{r} 5 \\ 2 \overline{)10} \end{array}$ , but that it means exactly the same thing.

Children should copy the division questions down in the new way and give the answers in their workbooks.



## OBJECTIVE

To reinforce the concept of inverses

## PACING

Level A All

Level B All

Level C All

## MATERIALS

blocks, 2 sets of blank cards

## RELATED AIDS

BFA COMP LAB I—120.

## BACKGROUND

Division can be related to multiplication by showing that they are inverse operations.

$$4 \times 3 = 12 \qquad 12 \div 3 = 4$$

Division "undoes" multiplication.

## SUGGESTIONS

**Initial Activity** Use blocks to illustrate an example similar to that at the top of the page. Relate the block illustration to an array, and record the multiplication story.

Take the set of blocks apart, arrange in "equal" groups, and write the corresponding division story.

## ACTIVITIES

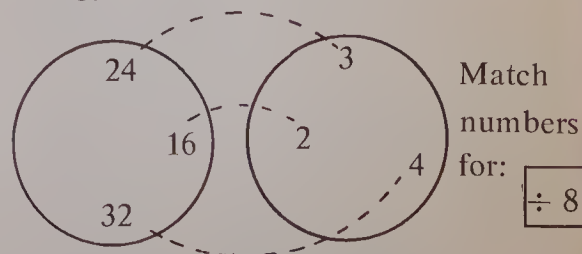
1. Make up 2 sets of cards — one set with multiplication stories and the other set with the related division story. Children could play a game of "Concentration" and match the two inverses.

2. Prepare cards such as:

Match the division stories and give the answer.

|                            |                    |
|----------------------------|--------------------|
| $12 \div 4 = \blacksquare$ | $5 \overline{)10}$ |
| $15 \div 3 = \blacksquare$ | $2 \overline{)16}$ |
| $16 \div 2 = \blacksquare$ | $3 \overline{)15}$ |
| $10 \div 5 = \blacksquare$ | $4 \overline{)12}$ |

3.



Match numbers for:  $\div 8$



## OBJECTIVE

To divide by 2

## PACING

Level A 1-17

Level B 1-19

Level C All

## MATERIALS

variety of concrete objects; overhead projector; transparency — 2 loops, for example,



## RELATED AIDS

BFA COMP LAB I—111.

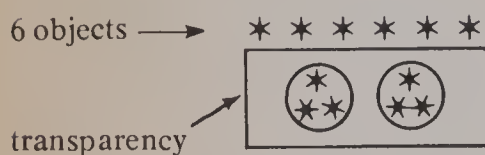
## BACKGROUND

It is important to emphasize the relationship between multiplication and division whenever possible. The children can then use their knowledge of multiplication facts to help them with their division facts.

## SUGGESTIONS

**Initial Activity** Take an even number of concrete objects and divide them between the two loops on the transparency. Record the findings.

*Example*



Record  $6 \div 2 = 3$  or  $2 \overline{)6} \begin{matrix} 3 \end{matrix}$ .

Do several examples using various even numbers before assigning the page.

Review the use of the symbol  $\overline{)}$  before assigning the page.

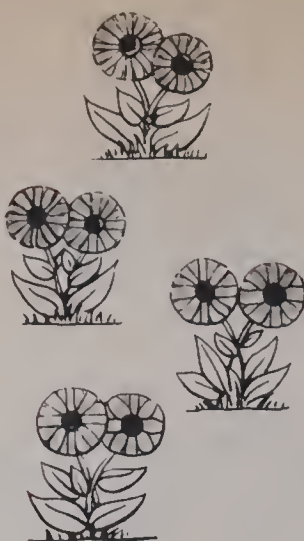
## ACTIVITIES

1. Break off two sections from an egg carton. Use concrete materials and have the children put equal groups into the two sections and record the corresponding division facts.

*Example*



## Dividing by 2



8 flowers.

Grouped in groups of 2.

4 groups of 2.

$$8 \div 2 = 4 \text{ or } 2 \overline{)8} \begin{matrix} 4 \end{matrix}$$

Divide.

1.  $18 \div 2 = \blacksquare 9$

2.  $12 \div 2 = \blacksquare 6$

3.  $10 \div 2 = \blacksquare 5$

4.  $16 \div 2 = \blacksquare 8$

5.  $20 \div 2 = \blacksquare 10$

6.  $6 \div 2 = \blacksquare 3$

7.  $4 \div 2 = \blacksquare 2$

8.  $14 \div 2 = \blacksquare 7$

9.  $8 \div 2 = \blacksquare 4$

Copy and complete.

10.  $2 \overline{)8} \begin{matrix} 4 \end{matrix}$

11.  $2 \overline{)10} \begin{matrix} 5 \end{matrix}$

12.  $2 \overline{)14} \begin{matrix} 7 \end{matrix}$

13.  $2 \overline{)6} \begin{matrix} 3 \end{matrix}$

14.  $2 \overline{)2} \begin{matrix} 1 \end{matrix}$

15.  $2 \overline{)18} \begin{matrix} 9 \end{matrix}$

16.  $2 \overline{)20} \begin{matrix} 10 \end{matrix}$

17.  $2 \overline{)12} \begin{matrix} 6 \end{matrix}$

18.  $2 \overline{)16} \begin{matrix} 8 \end{matrix}$

19.  $2 \overline{)14} \begin{matrix} 7 \end{matrix}$

20.  $2 \overline{)24} \begin{matrix} 12 \end{matrix}$

21.  $2 \overline{)26} \begin{matrix} 13 \end{matrix}$

228 Dividing by 2

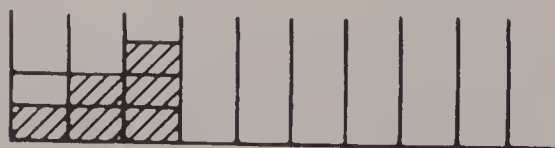
**Using the Book** Observe the artwork. Question the children:

1. How many flowers are there in all? (8)
2. How many flowers are in each group? (2)
3. How many groups are there? (4)
4. How can we write this division story? ( $8 \div 2 = 4$  or  $2 \overline{)8} \begin{matrix} 4 \end{matrix}$ )

Assign the page. The children fill in each  $\blacksquare$  for Exercises 1-9 in their workbooks. Children copy the division stories and give the answers for Exercises 10-21.

2. Make an accumulative chart for dividing by 2 up to  $2 \overline{)20}$ .

*Example*



$$2 \overline{)2} \quad 2 \overline{)4} \quad 2 \overline{)6} \text{ etc.}$$

3. Have the children make up a division problem to share with a partner. Have the partner use two ways of writing the problem.

4. Prepare cards:  $\boxtimes$ ,  $\boxless$ ,  $\equiv$

$9 \div 3$   $\square$   $3 \overline{)9}$

$4 \div 2$   $\square$   $10 \div 5$

$1 \overline{)6}$   $\square$   $4 \div 2$

# Dividing by 3



21 pussywillows.

3 on each branch.

7 branches.

$$21 \div 3 = 7 \quad \text{or} \quad 3 \overline{)21}^7$$

Divide.

- |                                 |                                  |                                 |
|---------------------------------|----------------------------------|---------------------------------|
| 1. $24 \div 3 = \blacksquare 8$ | 2. $18 \div 3 = \blacksquare 6$  | 3. $27 \div 3 = \blacksquare 9$ |
| 4. $15 \div 3 = \blacksquare 5$ | 5. $30 \div 3 = \blacksquare 10$ | 6. $12 \div 3 = \blacksquare 4$ |
| 7. $21 \div 3 = \blacksquare 7$ | 8. $9 \div 3 = \blacksquare 3$   | 9. $3 \div 3 = \blacksquare 1$  |

Copy and complete.

- |                          |                           |                           |                           |
|--------------------------|---------------------------|---------------------------|---------------------------|
| 10. $3 \overline{)27} 9$ | 11. $3 \overline{)6} 2$   | 12. $3 \overline{)15} 5$  | 13. $3 \overline{)21} 7$  |
| 14. $3 \overline{)12} 4$ | 15. $3 \overline{)30} 10$ | 16. $3 \overline{)9} 3$   | 17. $3 \overline{)24} 8$  |
| 18. $3 \overline{)18} 6$ | 19. $3 \overline{)15} 5$  | 20. $3 \overline{)33} 11$ | 21. $3 \overline{)36} 12$ |

Dividing by 3 229

**Using the Book** Focus the children's attention on the artwork. Question the children as follows:

- How many pussywillows do you see in all? (21)
- How many pussywillows are on each branch? (3)
- How many branches are there? (7)
- What division stories can we write for this? ( $3 \overline{)21}^7$  or  $21 \div 3 = 7$ )

Assign the page. Children are to copy the work and supply the answers in their workbooks.

## OBJECTIVE

To divide by 3

## PACING

Level A 1-17  
Level B 1-19  
Level C All

## MATERIALS

variety of concrete objects; overhead projector; transparency with 3 loops, for example,



## RELATED AIDS

BFA COMP LAB I—112.

## BACKGROUND

See page 228.

## SUGGESTIONS

**Initial Activity** Review counting by 3's to 30. Make a chart to use as a reference for dividing by 3. (See Activity 2, page 228.) Relate the use of  $\overline{)}$  as follows.

Example

$$\begin{array}{r} 1 \ 2 \ 3 \longrightarrow \text{etc.} \\ \div 3 \overline{)3} \ 6 \ 9 \ 12 \ 15 \ 18 \ 21 \ 24 \ 27 \ 30 \end{array}$$

Use the transparency as suggested for dividing by 2 for additional activities.

Do several examples with the children before assigning the page.

## ACTIVITIES

1. Use three sections of an egg carton. (See Activity 1, page 228.)

2. Have the children make a mat with 3 loops. Using concrete objects, have the children put equal groups in the 3 loops and record the corresponding division facts.

Example



$$\text{Record } 12 \div 3 = 4 \text{ or } 3 \overline{)12}^4$$

3. Use the "Missing Numbers" game in the Activity Reservoir. Modify to match the skills in this section.

4. Prepare cards. Put answer on reverse side of cards.

$$\begin{array}{l} \text{A } 21 \div 3 = \boxed{7} + 2 = \boxed{9} \div 3 = \boxed{3} \\ \text{B } 24 \div 4 = \boxed{6} + 2 = \boxed{8} \div 4 = \boxed{2} \text{ etc.} \end{array}$$

OBJECTIVE

To divide by 4

PACING

- Level A 1-17
- Level B 1-19
- Level C All

MATERIALS

variety of concrete objects

RELATED AIDS

BFA COMP LAB I—113.

BACKGROUND

See page 228.

SUGGESTIONS

**Initial Activity** Review counting by 4's to 40. Make a chart to use as a reference for dividing by 4. (See Activity 2, page 228.) Relate the use of  $\overline{)} \quad$  as follows.  
*Example*

$\div 4 \begin{array}{r} 1 \ 2 \ 3 \longrightarrow \text{etc.} \\ 4 \overline{) 8} \ 8 \ 12 \ 16 \ 20 \ 24 \ 28 \ 32 \ 36 \ 40 \end{array}$

Relate multiplication and division facts.  
*Example*

$\div 4 \begin{array}{r} 2 \\ 4 \overline{) 8} \end{array}$   
 $\textcircled{4} \times \textcircled{2} = \textcircled{8}$   
 $\textcircled{2} \times \textcircled{4} = \textcircled{8}$   
 $\textcircled{8} \div \textcircled{4} = \textcircled{2}$

Do several examples before assigning the page.

ACTIVITIES

1. Use four sections of an egg carton. (See Activity 1, page 228.)
2. Have the children make a mat with 4 loops. Using concrete objects, have the children put equal groups in the 4 loops and record the corresponding division facts.
3. Prepare cards. Have children complete the equations.

$12 \div 4 = \boxed{3} \quad 12 \div 3 = \boxed{4}$   
 $3 \times 4 = \boxed{12} \quad 4 \times 3 = \boxed{12}$   
 $16 \div 4 = \boxed{4} \quad 4 \overline{) 16} \begin{array}{r} 4 \\ \end{array} \quad 4 \times 4 = \boxed{16}$   
 $8 \div 4 = \boxed{2} \quad 8 \div 2 = \boxed{4}$   
 $2 \times 4 = \boxed{8} \quad 4 \times 2 = \boxed{8}$   
etc.

Dividing by 4



20 leaves.  
4 leaves on each plant.  
5 plants.

$20 - 4 = 5$  or  $4 \overline{) 20} \begin{array}{r} 5 \\ \end{array}$

Divide.

- 1.  $16 \div 4 = \blacksquare \quad 4$
- 2.  $8 - 4 = \blacksquare \quad 2$
- 3.  $24 - 4 = \blacksquare \quad 6$
- 4.  $20 \div 4 = \blacksquare \quad 5$
- 5.  $32 \div 4 = \blacksquare \quad 8$
- 6.  $40 \div 4 = \blacksquare \quad 10$
- 7.  $12 \div 4 = \blacksquare \quad 3$
- 8.  $36 \div 4 = \blacksquare \quad 9$
- 9.  $28 - 4 = \blacksquare \quad 7$

Copy and complete.

- 10.  $4 \overline{) 12} \quad 3$
- 11.  $4 \overline{) 20} \quad 5$
- 12.  $4 \overline{) 32} \quad 8$
- 13.  $4 \overline{) 16} \quad 4$
- 14.  $4 \overline{) 40} \quad 10$
- 15.  $4 \overline{) 36} \quad 9$
- 16.  $4 \overline{) 28} \quad 7$
- 17.  $4 \overline{) 24} \quad 6$
- 18.  $4 \overline{) 4} \quad 1$
- 19.  $4 \overline{) 16} \quad 4$
- ★ 20.  $4 \overline{) 44} \quad 11$
- ★ 21.  $4 \overline{) 48} \quad 12$

**Using the Book** Have the children observe the artwork at the top of the page. Ask, "How many leaves are there in all? (20)" "How many leaves are on each plant? (4)" "How many plants are there? (5)" "What division stories can be

written to go with this?  $\left( 20 \div 4 = 5 \text{ or } 4 \overline{) 20} \begin{array}{r} 5 \\ \end{array} \right)$ "

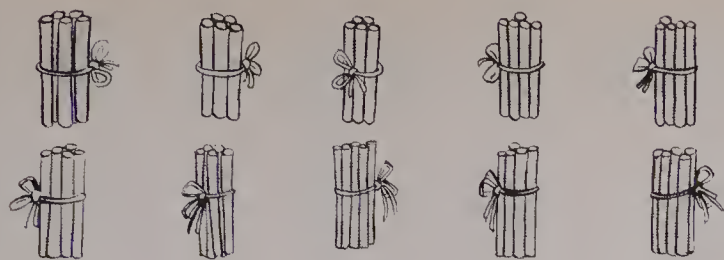
Have the children copy the division stories into their workbooks and supply the answers. Exercises 1, 2, and 3 may be verified in the back of the book.

4. Teacher prepares cards. The children answer questions, and then put the quotients in order from most to least.

$12 \div 3 = \blacksquare$   
 $4 \div 4 = \blacksquare$   
 $8 \div 4 = \blacksquare \quad \text{---, ---, ---, ---}$   
 $6 \div 2 = \blacksquare$



# Dividing by 5



50 sticks.

5 in each bundle.

10 bundles.

$$50 \div 5 = 10 \quad \text{or} \quad 5 \overline{)50}^{10}$$

Divide.

1.  $45 \div 5 = \blacksquare 9$       2.  $30 \div 5 = \blacksquare 6$       3.  $10 \div 5 = \blacksquare 2$

4.  $15 \div 5 = \blacksquare 3$       5.  $25 \div 5 = \blacksquare 5$       6.  $35 \div 5 = \blacksquare 7$

7.  $20 \div 5 = \blacksquare 4$       8.  $40 \div 5 = \blacksquare 8$       9.  $50 \div 5 = \blacksquare 10$

Copy and complete.

10.  $5 \overline{)25} \quad 5$       11.  $5 \overline{)40} \quad 8$       12.  $5 \overline{)15} \quad 3$       13.  $5 \overline{)35} \quad 7$

14.  $5 \overline{)10} \quad 2$       15.  $5 \overline{)50} \quad 10$       16.  $5 \overline{)20} \quad 4$       17.  $5 \overline{)45} \quad 9$

18.  $5 \overline{)30} \quad 6$       19.  $5 \overline{)5} \quad 1$       20.  $5 \overline{)55} \quad 11$       21.  $5 \overline{)60} \quad 12$

Dividing by 5 231

**Using the Book** Focus attention on the artwork at the top of the page. Ask, "How many sticks are there in all? (50)" "How many sticks are in each bundle? (5)" "How many bundles are there? (10)" "What division stories could go with

this? ( $50 \div 5 = 10$  or  $5 \overline{)50}^{10}$ )"

Children are to copy the division stories and complete them in their workbooks.

## OBJECTIVE

To divide by 5

## PACING

Level A 1-17

Level B 1-19

Level C All

## RELATED AIDS

BFA COMP LAB I—114.

HMS—DM65.

## SUGGESTIONS

**Initial Activity** Review counting by 5's to 50. Make a chart to use as a reference for dividing by 5. (See Activity 2, page 228.) Relate the use of  $\overline{)}$  as follows.

*Example*

$$\begin{array}{r} 1 \\ \div 5 \overline{)5} \end{array} \quad 2 \quad 3 \rightarrow \text{etc.}$$

Refer to the numbers and show the corresponding multiplication and division stories.

*Example*

$$\begin{array}{r} 1 \\ \div 5 \overline{)5} \end{array} \quad \begin{array}{l} \textcircled{5} \times \textcircled{1} = \textcircled{5} \\ \textcircled{1} \times \textcircled{5} = \textcircled{5} \\ \textcircled{5} \div \textcircled{5} = \textcircled{1} \end{array}$$

Do several examples with the children.

## ACTIVITIES

1. Use five sections of an egg carton. (See Activity 1, page 228.)

2. Make a mat with 5 loops. Using concrete objects, put equal groups of objects in the 5 loops and record the corresponding division facts.

3. Have children make arrays for division by 5 and record accompanying division stories in two ways.

4. Prepare cards.

What sign do I use?

$$12 \overline{)4} \quad 4 = 3 \quad 4 \times 4 = 16$$

$$2 \overline{+} 5 = 7 \quad 8 \overline{\div} 8 = 1$$

$$10 \overline{\div} 2 = 5 \quad 9 \overline{-} 6 = 3$$

etc.

OBJECTIVE

To provide practice in division

PACING

- Level A All
- Level B All
- Level C 1-36

ACTIVITIES

1. Use "The Multiplication Game" and/or "The Facts Machine" game in the Activity Reservoir. Modify to match the skills in this section.

2. On teacher-prepared cards, give the children a series of division stories. Have the children select a division story. The children give the quotient and then write a problem using the story. Have children use these with a friend.

Example

45 ÷ 5 = 9

Child may write: "I have 45 balloons. I have 5 packages for the balloons. How many will be in each package?"

Tune Up

Divide.

1. 10 ÷ 2 = 5

4. 10 ÷ 1 = 10

7. 18 ÷ 2 = 9

10. 21 ÷ 3 = 7

13. 15 ÷ 3 = 5
2. 25 ÷ 5 = 5

5. 24 ÷ 3 = 8

8. 20 ÷ 5 = 4

11. 45 ÷ 5 = 9

14. 20 ÷ 4 = 5
3. 36 ÷ 4 = 9

6. 15 ÷ 5 = 3

9. 40 ÷ 4 = 10

12. 20 ÷ 2 = 10

15. 27 ÷ 3 = 9

Copy and complete.

16. 3 21 7

17. 5 25 5

18. 4 20 5
19. 2 18 9

20. 4 24 6

21. 3 15 5
22. 3 18 6

23. 4 36 9

24. 5 25 5
25. 5 50 10

26. 2 12 6

27. 3 15 5
28. 4 40 10

29. 5 35 7

30. 2 24 12

Write a division story for each of these.

31. 5 × 5 = 25 25 ÷ 5 = 5

32. 4 × 10 = 40 40 ÷ 10 = 4

33. 6 × 5 = 30 30 ÷ 5 = 6
34. 8 × 3 = 24 24 ÷ 3 = 8

35. 7 × 2 = 14 14 ÷ 2 = 7

36. 5 × 4 = 20 20 ÷ 4 = 5
37. 9 × 1 = 9 9 ÷ 1 = 9

38. 6 × 3 = 18 18 ÷ 3 = 6

39. 9 × 4 = 36 36 ÷ 4 = 9
40. 7 × 4 = 28 28 ÷ 4 = 7

41. 6 × 6 = 36 36 ÷ 6 = 6

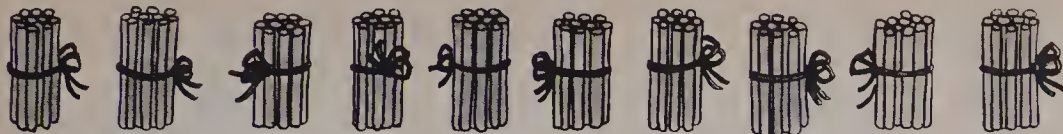
42. 4 × 7 = 28 28 ÷ 7 = 4
43. 8 × 4 = 32 32 ÷ 4 = 8

44. 9 × 5 = 45 45 ÷ 5 = 9

45. 3 × 9 = 27 27 ÷ 9 = 3

Using the Book Children are to copy and complete the questions in their workbooks.

# Dividing by 10



50 sticks.

10 in each bundle.

5 bundles.

$$50 \div 10 = 5 \quad \text{or} \quad 10 \overline{)50}^5$$

Divide.

1.  $90 \div 10 = \blacksquare 9$       2.  $30 \div 10 = \blacksquare 3$       3.  $60 \div 10 = \blacksquare 6$

4.  $100 \div 10 = \blacksquare 10$       5.  $20 \div 10 = \blacksquare 2$       6.  $40 \div 10 = \blacksquare 4$

7.  $80 \div 10 = \blacksquare 8$       8.  $50 \div 10 = \blacksquare 5$       9.  $70 \div 10 = \blacksquare 7$

Copy and complete.

10.  $10 \overline{)80} 8$       11.  $10 \overline{)40} 4$       12.  $10 \overline{)90} 9$       13.  $10 \overline{)60} 6$

14.  $10 \overline{)70} 7$       15.  $10 \overline{)100} 10$       16.  $10 \overline{)30} 3$       17.  $10 \overline{)50} 5$

18.  $10 \overline{)20} 2$       ★19.  $10 \overline{)120} 12$       ★20.  $10 \overline{)140} 14$       ★21.  $10 \overline{)110} 11$

Dividing by 10 233

**Using the Book** Draw children's attention to the artwork at the top of the page. Ask, "How many sticks do you see in all? (50)" "How many sticks are in each bundle? (10)" "How many bundles are there? (5)" "In what two ways can

we write this division story?  $\left( 50 \div 10 = 5 \quad \text{or} \quad 10 \overline{)50}^5 \right)$ "

Assign the page. Have the children copy and complete the division stories in their workbooks. Emphasize the search for patterns by examining the graph made in the Initial Activity and by reviewing the use of place value.

## OBJECTIVE

To divide by 10

## PACING

Level A All

Level B All

Level C All

## MATERIALS

bundles of 10 sticks

## RELATED AIDS

HMS—DM66.

## BACKGROUND

See page 228.

## SUGGESTIONS

**Initial Activity** Review counting by 10's to 100.

Using the bundles of 10 sticks, demonstrate several examples of dividing by 10. Make a graph to show the results.

*Example*



$10 \overline{)10}^1$        $10 \overline{)20}^2$       etc.

## ACTIVITIES

1. Make up a set of cards (10 per set) with ten dots on each card. The children take a random number of cards and write the appropriate division story. The procedure is then repeated.



40 dots

$40 \div 10 = 4$  or  $10 \overline{)40}^4$

2. Use Problem of the Week, #31 (number combinations).

3. Prepare division facts of ten on cards. Child gives the quotient for each and then uses the cards (quotients covered) as flash cards with a partner to check answers.

Quotients can be covered with hand while checking with partner.

$90 \div 10 = \blacksquare$        $20 \div 10 = \blacksquare$

$50 \div 10 = \blacksquare$        $80 \div 10 = \blacksquare$

$10 \div 10 = \blacksquare$        $60 \div 10 = \blacksquare$



## OBJECTIVE

To review and reinforce the concept of number families

## PACING

Level A All  
Level B All  
Level C All

## MATERIALS

discs with numerals on them

## BACKGROUND

This concept should be emphasized because it will reinforce the idea of inverses.

## SUGGESTIONS

**Initial Activity** Set up a situation similar to that at the top of page 234. Give the names of the numbers in the family and have the children name the number family. Use discs with numbers on them.

## ACTIVITIES

1. Have children divided into groups of 4. On cards, give each group a set of numbers which are members of a family, i.e., 36, 9, 4. Have each child supply one story for the family, each on a separate piece of paper. Staple papers together for a booklet.

2. Switch booklets to other groups. Have each child draw an array for each story.

3. Switch booklets again. Have members of the group dramatize with whole class (or as many people as needed) each number story. Other children should guess the number story.

## Number Families

This is the "15 Family" and here are some members of the "15 Family".



Here are some stories about the "15 Family".

$$3 \times 5 = 15$$

$$5 \times 3 = 15$$

$$15 \div 3 = 5$$

$$15 \div 5 = 3$$

Make four stories to go with the members of these families.

Name the family.

- |                  |                |                |
|------------------|----------------|----------------|
| 1. (a) 12, 3, 4. | (b) 20, 4, 5.  | (c) 15, 5, 3.  |
| (d) 24, 4, 6.    | (e) 21, 7, 3.  | (f) 8, 4, 2.   |
| (g) 18, 3, 6.    | (h) 27, 3, 9.  | (i) 10, 5, 2.  |
| 2. (a) 6, 3, 2.  | (b) 12, 6, 2.  | (c) 24, 2, 12. |
| (d) 32, 4, 8.    | (e) 50, 10, 5. | (f) 24, 8, 3.  |
| (g) 14, 7, 2.    | (h) 36, 9, 4.  | (i) 45, 9, 5.  |

234 Number families

**Using the Book** Focus attention on the artwork at the top of the page. Tell the children that the arrow directs us to the "15 Family". Ask, "Which members of the '15 Family' are in the house? (3, 5)" Ask children to tell some stories about 3 and 5 as members of the "15 Family".

Name two multiplication stories.

$$3 \times 5 = 15$$

$$5 \times 3 = 15$$

Name two division stories.

$$15 \div 3 = 5$$

$$15 \div 5 = 3$$

Ask, "How many stories can we tell about these members of the '15 Family'?" (4)"

Assign the page. Have children give four stories for each family and tell what number family it is. Exercise 1(a) and (b) can be verified in the back of the book. Emphasize that there will be four number stories for each number family.

**Answers:**

1. (a)  $3 \times 4 = 12$ ,  $4 \times 3 = 12$ ,  $12 \div 4 = 3$ ,  $12 \div 3 = 4$  (b)  $4 \times 5 = 20$ ,  $5 \times 4 = 20$ ,  $20 \div 5 = 4$ ,  $20 \div 4 = 5$  (c)  $5 \times 3 = 15$ ,  $3 \times 5 = 15$ ,  $15 \div 5 = 3$ ,  $15 \div 3 = 5$   
(d)  $4 \times 6 = 24$ ,  $6 \times 4 = 24$ ,  $24 \div 6 = 4$ ,  $24 \div 4 = 6$  (e)  $7 \times 3 = 21$ ,  $3 \times 7 = 21$ ,  $21 \div 3 = 7$ ,  $21 \div 7 = 3$  (f)  $4 \times 2 = 8$ ,  $2 \times 4 = 8$ ,  $8 \div 2 = 4$ ,  $8 \div 4 = 2$   
(g)  $3 \times 6 = 18$ ,  $6 \times 3 = 18$ ,  $18 \div 6 = 3$ ,  $18 \div 3 = 6$  (h)  $3 \times 9 = 27$ ,  $9 \times 3 = 27$ ,  $27 \div 9 = 3$ ,  $27 \div 3 = 9$  (i)  $5 \times 2 = 10$ ,  $2 \times 5 = 10$ ,  $10 \div 2 = 5$ ,  $10 \div 5 = 2$
2. (a)  $3 \times 2 = 6$ ,  $2 \times 3 = 6$ ,  $6 \div 2 = 3$ ,  $6 \div 3 = 2$  (b)  $6 \times 2 = 12$ ,  $2 \times 6 = 12$ ,  $12 \div 2 = 6$ ,  $12 \div 6 = 2$  (c)  $2 \times 12 = 24$ ,  $12 \times 2 = 24$ ,  $24 \div 12 = 2$ ,  $24 \div 2 = 12$   
(d)  $4 \times 8 = 32$ ,  $8 \times 4 = 32$ ,  $32 \div 8 = 4$ ,  $32 \div 4 = 8$  (e)  $10 \times 5 = 50$ ,  $5 \times 10 = 50$ ,  $50 \div 5 = 10$ ,  $50 \div 10 = 5$  (f)  $8 \times 3 = 24$ ,  $3 \times 8 = 24$ ,  $24 \div 3 = 8$ ,  $24 \div 8 = 3$   
(g)  $7 \times 2 = 14$ ,  $2 \times 7 = 14$ ,  $14 \div 2 = 7$ ,  $14 \div 7 = 2$  (h)  $9 \times 4 = 36$ ,  $4 \times 9 = 36$ ,  $36 \div 4 = 9$ ,  $36 \div 9 = 4$  (i)  $9 \times 5 = 45$ ,  $5 \times 9 = 45$ ,  $45 \div 5 = 9$ ,  $45 \div 9 = 5$

# Number Families

Here are 2 stories for a "family". Write 2 more.

1.  $4 \times 2 = 8$   $8 \div 2 = 4$  2.  $4 \times 5 = 20$   $20 \div 5 = 4$  3.  $5 \times 6 = 30$   $30 \div 6 = 5$   
 $2 \times 4 = 8$   $8 \div 4 = 2$   $5 \times 4 = 20$   $20 \div 4 = 5$   $6 \times 5 = 30$   $30 \div 5 = 6$

Write 3 more stories for each family.

4.  $3 \times 10 = 30$   $30 \div 10 = 3$  5.  $9 \times 5 = 45$   $45 \div 5 = 9$  6.  $9 \times 10 = 90$   $90 \div 10 = 9$   
 $10 \times 3 = 30$   $30 \div 3 = 10$   $5 \times 9 = 45$   $45 \div 9 = 5$   $10 \times 9 = 90$   $90 \div 9 = 10$

Write 2 more stories for each of these.

7.  $10 \div 2 = 5$   $5 \times 2 = 10$  8.  $35 \div 5 = 7$   $7 \times 5 = 35$  9.  $40 \div 5 = 8$   $8 \times 5 = 40$   
 $10 \div 5 = 2$   $2 \times 5 = 10$   $35 \div 7 = 5$   $5 \times 7 = 35$   $40 \div 8 = 5$   $5 \times 8 = 40$

Write 3 more stories for each family.

10.  $24 \div 6 = 4$   $4 \times 6 = 24$  11.  $12 \div 3 = 4$   $4 \times 3 = 12$  12.  $80 \div 10 = 8$   $8 \times 10 = 80$   
 $24 \div 4 = 6$   $6 \times 4 = 24$   $12 \div 4 = 3$   $3 \times 4 = 12$   $80 \div 8 = 10$   $10 \times 8 = 80$   
13.  $21 \div 3 = 7$   $7 \times 3 = 21$  14.  $20 \div 4 = 5$   $5 \times 4 = 20$  15.  $15 \div 5 = 3$   $3 \times 5 = 15$   
 $21 \div 7 = 3$   $3 \times 7 = 21$   $20 \div 5 = 4$   $4 \times 5 = 20$   $15 \div 3 = 5$   $5 \times 3 = 15$   
16.  $24 \div 2 = 12$   $12 \times 2 = 24$  17.  $14 \div 2 = 7$   $7 \times 2 = 14$  18.  $15 \div 3 = 5$   $5 \times 3 = 15$   
 $24 \div 12 = 2$   $2 \times 12 = 24$   $14 \div 7 = 2$   $2 \times 7 = 14$   $15 \div 5 = 3$   $3 \times 5 = 15$   
19.  $60 \div 10 = 6$   $6 \times 10 = 60$  20.  $12 \div 4 = 3$   $3 \times 4 = 12$  21.  $18 \div 3 = 6$   $6 \times 3 = 18$   
 $60 \div 6 = 10$   $10 \times 6 = 60$   $12 \div 3 = 4$   $4 \times 3 = 12$   $18 \div 6 = 3$   $3 \times 6 = 18$   
22.  $24 \div 4 = 6$   $6 \times 4 = 24$  23.  $20 \div 5 = 4$   $4 \times 5 = 20$  24.  $20 \div 2 = 10$   $10 \times 2 = 20$   
 $24 \div 6 = 4$   $4 \times 6 = 24$   $20 \div 4 = 5$   $5 \times 4 = 20$   $20 \div 10 = 2$   $2 \times 10 = 20$   
25.  $70 \div 10 = 7$  26.  $50 \div 5 = 10$  27.  $36 \div 4 = 9$   
28.  $24 \div 6 = 4$  29.  $32 \div 4 = 8$  30.  $21 \div 3 = 7$   
31.  $25 \div 5 = 5$  32.  $28 \div 7 = 4$  33.  $50 \div 10 = 5$

Number families 235

## OBJECTIVE

To review and reinforce the concept of number families

## PACING

Level A All  
 Level B All  
 Level C 1-9, 19-33

## SUGGESTIONS

**Initial Activity** See preceding page for Initial Activity.

## ACTIVITIES

1. Have the children make up riddles for "What is my family?" and exchange riddles with a friend.

2. The children may want to make up cartoon characters for the members of different number "families".

3. Use the "Missing Numbers" game in the Activity Reservoir. Modify to match the skills in this section.

**Using the Book** When the teacher is certain that the children are sure of this concept, the children should be assigned this page to be done independently.

Answers:

25.  $70 \div 7 = 10$   $7 \times 10 = 70$  26.  $50 \div 10 = 5$   $10 \times 5 = 50$   
 $10 \times 7 = 70$   $5 \times 10 = 50$   
27.  $36 \div 9 = 4$   $9 \times 4 = 36$  28.  $24 \div 4 = 6$   $4 \times 6 = 24$   
 $4 \times 9 = 36$   $6 \times 4 = 24$   
29.  $32 \div 8 = 4$   $8 \times 4 = 32$  30.  $21 \div 7 = 3$   $7 \times 3 = 21$   
 $4 \times 8 = 32$   $3 \times 7 = 21$   
31.  $5 \times 5 = 25$  32.  $28 \div 4 = 7$   $4 \times 7 = 28$   
 $7 \times 4 = 28$   
33.  $50 \div 5 = 10$   $5 \times 10 = 50$   
 $10 \times 5 = 50$

OBJECTIVE

To use a 10 × 10 table for division

PACING

- Level A All
- Level B All
- Level C 1-16

MATERIALS

transparency of a division table for use on an overhead projector, or chart for use at the front of the class (This should be colour coded to match the one in the textbook.)

SUGGESTIONS

**Initial Activity** Use the overhead and transparency (or chart) to illustrate the use of the division table. The children should be given the same directions that are found on the page so that they will be able to continue independently when the page is assigned.

Do several examples before assigning the page.

ACTIVITIES

- 1. Have children help prepare division question cards without answers.  $5 \overline{)25}$

When a suitable number have been assembled, distribute them on a random basis for completion. These cards can be checked and used as flash cards for later review.

- 2. The teacher prepares cards for the children to work with in pairs. List a series of division questions on one card and on another, bowling pins numbered randomly from 1 to 10. When one child reads the division question, the partner crosses off the appropriate bowling pin which has the answer (quotient) on it.

$10 \div 5 =$

$25 \div 5 =$

$9 \div 3 =$

$8 \div 1 =$

etc.

2

5

3

8



Using the Multiplication Table

Your multiplication can help you to divide numbers.

| ×  | 0 | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10  |
|----|---|----|----|----|----|----|----|----|----|----|-----|
| 0  | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0   |
| 1  | 0 | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10  |
| 2  | 0 | 2  | 4  | 6  | 8  | 10 | 12 | 14 | 16 | 18 | 20  |
| 3  | 0 | 3  | 6  | 9  | 12 | 15 | 18 | 21 | 24 | 27 | 30  |
| 4  | 0 | 4  | 8  | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40  |
| 5  | 0 | 5  | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50  |
| 6  | 0 | 6  | 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54 | 60  |
| 7  | 0 | 7  | 14 | 21 | 28 | 35 | 42 | 49 | 56 | 63 | 70  |
| 8  | 0 | 8  | 16 | 24 | 32 | 40 | 48 | 56 | 64 | 72 | 80  |
| 9  | 0 | 9  | 18 | 27 | 36 | 45 | 54 | 63 | 72 | 81 | 90  |
| 10 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |

$4 \overline{)24}$

- (a) Find 4 in the red row.
- (b) Go down from 4 and stop on 24.
- (c) Go left to the blue column to find the answer. (6)

1.  $10 \div 5 =$

2.  $30 \div 5 =$

3.  $8 \div 4 =$

4.  $16 \div 2 =$
5.  $6 \div 2 =$

6.  $15 \div 3 =$

7.  $12 \div 4 =$

8.  $4 \div 4 =$
9.  $5 \div 5 =$

10.  $14 \div 2 =$

11.  $24 \div 3 =$

12.  $10 \div 2 =$
13.  $2 \overline{)16}$

14.  $3 \overline{)21}$

15.  $4 \overline{)20}$

16.  $5 \overline{)5}$
17.  $1 \overline{)2}$

18.  $4 \overline{)16}$

19.  $3 \overline{)27}$

20.  $2 \overline{)18}$

236 Using 10 × 10 table for division

**Using the Book** Draw the children’s attention to the division question at the right-hand side of the page.  $4 \overline{)24}$  Ask, “What number are we dividing by? (4)” “What number is being divided? (24)” Tell the children to locate 4 in the row of red numbers and go straight down to 24. Tell the children to go straight left to find the answer in the blue column. “What is the answer? (6)” Instruct children to copy the questions at the bottom of the page into their workbooks. The children use the table to find the correct answers to be filled in.

- 3. Use the “Missing Numbers” game in the Activity Reservoir for review of multiplication and division facts.

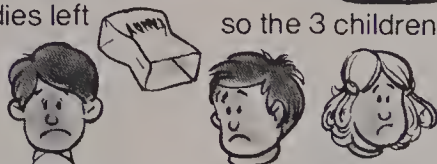


# Sharing Nothing

The children are trying to guess how many candies are in the bag. They will share among the three of them.



But, there were no candies left so the 3 children didn't get any candy.



$$0 \div 3 = 0 \quad (\text{no candies each}).$$

Copy and complete.

- |                                  |                                  |                                  |
|----------------------------------|----------------------------------|----------------------------------|
| 1. $0 \div 9 = \blacksquare 0$   | 2. $0 \div 2 = \blacksquare 0$   | 3. $0 \div 15 = \blacksquare 0$  |
| 4. $0 \div 6 = \blacksquare 0$   | 5. $0 \div 1 = \blacksquare 0$   | 6. $0 \div 10 = \blacksquare 0$  |
| 7. $0 \div 4 = \blacksquare 0$   | 8. $0 \div 100 = \blacksquare 0$ | 9. $0 \div 34 = \blacksquare 0$  |
| 10. $0 \div 49 = \blacksquare 0$ | 11. $0 \div 3 = \blacksquare 0$  | 12. $0 \div 68 = \blacksquare 0$ |

Dividing zero 237

**Using the Book** Focus the children's attention on the artwork at the top of the page. Tell the children that the children in the picture want to share the candies in the bag, *but* there are NO candies in the bag. Ask, "If three children want to share nothing, how many candies will each child get? (0, none, nothing)" "What division story could go with this?"  $(0 \div 3 = 0 \text{ or } 3 \overline{)0})$  Each child gets zero candies.

Assign the page. Have the children copy and complete each division story.

## OBJECTIVE

To divide zero by a given number

## PACING

Level A All  
Level B All  
Level C All

## MATERIALS

bag

## SUGGESTIONS

**Initial Activity** Set up a situation similar to that at the top of the page. Emphasize that when you have nothing as a quantity to be shared, each portion (share) will always be zero. Refer to multiplying by zero.

## ACTIVITIES

1. Have the children make up questions involving division of zero and exchange them with a friend.

2. Illustrate the problems made up for Activity 1 possibly including addition, subtraction, and multiplication of zero problems also. Use these to assemble an appropriately-titled booklet: "The Nothing Book".

3. Have children make patterns. (See previous work on graphs showing division.) The teacher sets up:  $0 \times 5 = \blacksquare$ ,  $1 \times 5 = \blacksquare$ ,  $2 \times 5 = \blacksquare$ , etc. The children choose their own factors for the next pattern.

*Example*

|              |    |              |
|--------------|----|--------------|
| $0 \times 3$ | or | $0 \times 1$ |
| $1 \times 3$ |    | $1 \times 1$ |
| $2 \times 3$ |    | $2 \times 1$ |
| $3 \times 3$ |    | $3 \times 1$ |
| etc.         |    | etc.         |

## OBJECTIVE

To provide practice in multiplication and division

## PACING

Level A All  
Level B All  
Level C All

## RELATED AIDS

HMS—DM67.

## SUGGESTIONS

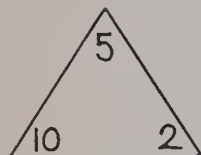
**Initial Activity** With a transparency and overhead projector or a chart, set up a multiplication or division ladder and show how it is used.

Tell children that numbers being multiplied or divided always appear in the left-hand column. The number that you divide or multiply by is always at the top of both columns. The child's job is to complete the operation (multiplication or division) and record the answer in the correct space in the right-hand column.

## ACTIVITIES

1. Use the "Patchwork Quilt" game in the Activity Reservoir. Modify to match the skills in this section.

2. Use triangle-shaped paper. Number each corner with the numbers of a multiplication/division story.



Cover 10. "What is the product of  $5 \times 2$ ? (10)"

Cover 5. "What is the quotient of  $10 \div 2$ ? (5)"

3. Have the children work in groups of two. Give each group a blank sheet of paper. Give a multiplication or division question, i.e.,  $4 \times 6 = 24$ . Children give the related questions:  $6 \times 4 = 24$ ,  $24 \div 6 = 4$ ,  $24 \div 4 = 6$ . The children stand up when they have finished. Do five questions. Winners are those who finish first.

## $\times$ and $\div$ Ladders

Copy and complete.

1.

| $\times 2$ |    |
|------------|----|
| 0          | 0  |
| 1          | 2  |
| 2          |    |
| 3          | 6  |
| 4          | 8  |
| 5          | 10 |
| 6          | 12 |
| 7          | 14 |
| 8          | 16 |
| 9          | 18 |
| 10         | 20 |

2.

| $\times 3$ |    |
|------------|----|
| 0          | 0  |
| 1          | 3  |
| 2          | 6  |
| 3          | 9  |
| 4          | 12 |
| 5          | 15 |
| 6          | 18 |
| 7          | 21 |
| 8          | 24 |
| 9          | 27 |
| 10         | 30 |

3.

| $\times 4$ |    |
|------------|----|
| 0          | 0  |
| 1          | 4  |
| 2          | 8  |
| 3          | 12 |
| 4          | 16 |
| 5          | 20 |
| 6          | 24 |
| 7          | 28 |
| 8          | 32 |
| 9          | 36 |
| 10         | 40 |

4.

| $\times 5$ |    |
|------------|----|
| 0          | 0  |
| 1          | 5  |
| 2          | 10 |
| 3          | 15 |
| 4          | 20 |
| 5          | 25 |
| 6          | 30 |
| 7          | 35 |
| 8          | 40 |
| 9          | 45 |
| 10         | 50 |

5.

| $\div 2$ |    |
|----------|----|
| 0        | 0  |
| 2        | 1  |
| 4        | 2  |
| 6        | 3  |
| 8        | 4  |
| 10       | 5  |
| 12       | 6  |
| 14       | 7  |
| 16       | 8  |
| 18       | 9  |
| 20       | 10 |

6.

| $\div 3$ |    |
|----------|----|
| 0        | 0  |
| 3        | 1  |
| 6        | 2  |
| 9        | 3  |
| 12       | 4  |
| 15       | 5  |
| 18       | 6  |
| 21       | 7  |
| 24       | 8  |
| 27       | 9  |
| 30       | 10 |

7.

| $\div 4$ |    |
|----------|----|
| 0        | 0  |
| 4        | 1  |
| 8        | 2  |
| 12       | 3  |
| 16       | 4  |
| 20       | 5  |
| 24       | 6  |
| 28       | 7  |
| 32       | 8  |
| 36       | 9  |
| 40       | 10 |

8.

| $\div 5$ |    |
|----------|----|
| 0        | 0  |
| 5        | 1  |
| 10       | 2  |
| 15       | 3  |
| 20       | 4  |
| 25       | 5  |
| 30       | 6  |
| 35       | 7  |
| 40       | 8  |
| 45       | 9  |
| 50       | 10 |

238 Practice

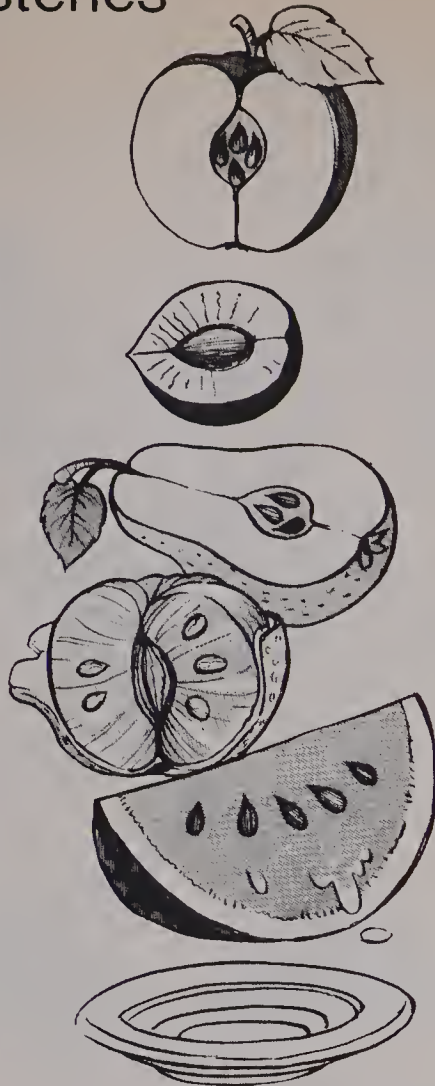
**Using the Book** Assign the page and have the children copy the ladders and complete the answers in the right-hand column.



# Fruitful Mysteries

Write the number stories.

1. One apple has 4 seeds in it.  
How many seeds are there in 5 apples? **20**
2. One plum has 1 seed.  
How many seeds are there in 9 plums? **9**
3. One pear has 3 seeds.  
How many seeds are there in 9 pears? **27**
4. One orange has 5 seeds.  
How many seeds are there in 6 oranges? **30**
5. Each watermelon slice has 5 seeds.  
There are 45 seeds altogether.  
How many slices are there? **9**
6. Four children want to share some peaches.  
There are no peaches left.  
How many peaches will each child have? **0**



Word problems 239

## OBJECTIVE

To solve word problems using multiplication and division

## PACING

Level A All  
Level B All  
Level C All

## MATERIALS

variety of dried seeds (apple, orange, etc.)

## SUGGESTIONS

**Initial Activity** Use dried seeds to demonstrate some problems similar to those on this page.

You may wish to help the children decide the operation to be used by having them determine whether the numbers represent factors or products.

If you have two factors represented, then you would multiply to find the answer.

If you have one factor and one product, then you would divide to find the answer. Make a chart to show this rule and post it in the room as a reference.

*Example*

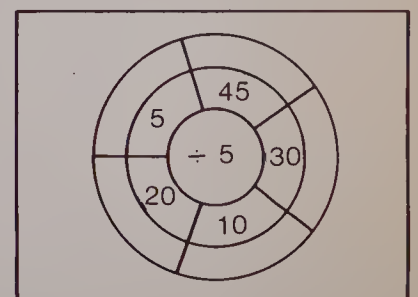
|                                      |              |
|--------------------------------------|--------------|
|                                      | ( $\times$ ) |
| factor and factor $\longrightarrow$  | multiply     |
|                                      | ( $\div$ )   |
| factor and product $\longrightarrow$ | divide       |

## ACTIVITIES

1. Give the children a topic such as kites, cars, animals, and have them make up their own mysteries to share with others.

2. Prepare a card with the following directions for the children: "Choose five people in your class. Keep a record of how often in one week each one wears your favourite colour. Make a graph at the end of the week to show the results."

3. Prepare cards such as:





## OBJECTIVE

To provide practice in multiplication and division through the use of special interest topics

## PACING

Level A 1  
Level B 1  
Level C All

## SUGGESTIONS

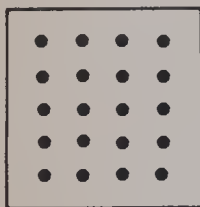
**Initial Activity** Use the overhead projector and transparency or chart to illustrate to children how to use the square to show family stories.

*Example*

$$4 \times 5 = 20$$

$$5 \times 4 = 20$$

20 spots



$$20 \div 4 = 5$$

$$20 \div 5 = 4$$

## ACTIVITIES

1. Provide the children with blank squares to do stories on their own.

2. Prepare riddle cards.

*Example*

Solve this riddle. "I am greater than 20. I am less than 25. One of my factors is 7. Who am I?"

3. Do some oral computation. Children listen to all the directions and write the answer only.

*Example*

" $6 \times 8 = \blacksquare$  (pause)  $- 3 = \blacksquare$  (pause)  $\div 9 = \blacksquare$  (pause)  $+ 10 = \blacksquare$  (pause)  $- 1 = \blacksquare$  (pause)  $\div 7 =$  write answer ."

## More Family Stories

1. This square has 12 spots.

Make up 4 number stories about 12 and put one on each corner.

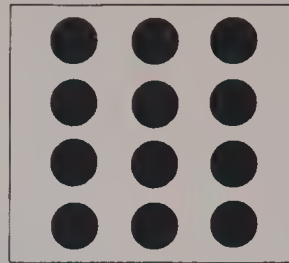
One is done for you.

$$3 \times 4 = 12$$

$$12 \div 4 = 3$$

$$4 \times 3 = 12$$

$$12 \div 3 = 4$$



Draw some more squares and make stories to go with:

$$3 \times 5 = 15$$

$$5 \times 3 = 15$$

$$15 \div 5 = 3$$

$$15 \div 3 = 5$$

15 spots.

$$2 \times 4 = 8$$

$$4 \times 2 = 8$$

$$8 \div 4 = 2$$

$$8 \div 2 = 4$$

8 spots.

$$2 \times 12 = 24$$

$$12 \times 2 = 24$$

$$24 \div 12 = 2$$

$$24 \div 2 = 12$$

24 spots.

$$3 \times 8 = 24$$

$$8 \times 3 = 24$$

$$24 \div 8 = 3$$

$$24 \div 3 = 8$$

$$4 \times 6 = 24$$

$$\text{or } 6 \times 4 = 24$$

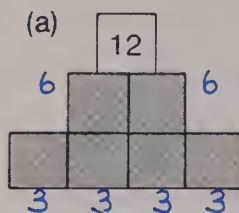
$$24 \div 6 = 4$$

$$\text{or } 24 \div 4 = 6$$

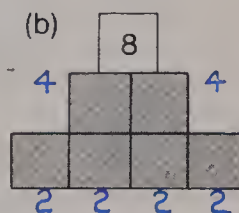
2. Fill in the numbers and balance each row.

The number in each row must equal the number on top.

(a)



(b)



## BRAINTICKLER

I am more than  $3 \times 4$   
but less than  $4 \times 4$ .

I cannot be divided  
by 2 or 3.

Who am I? 13

240 Puzzles

**Using the Book** Have the children draw squares, fill in spots, and write four stories for each question.

# Factory Workers

1. John put 20 wheels on cars.  
He put 4 on each car.  
How many cars? **5**
2. Diane sewed 18 buttons on red shirts.  
She sewed 2 on each shirt.  
How many shirts? **9**
3. Susie put 16 headlights on cars.  
She put them on 4 cars.  
How many headlights on each car? **4**
4. Serge put knobs on 5 stoves.  
He put 25 knobs on stoves.  
How many knobs on each stove? **5**
5. Sherrie drove 9 cars for the factory each day.  
She worked 8 days.  
How many cars? **72**
6. Bruce packed 5 chocolate bunnies in a box.  
He packed 4 boxes in 1 h.  
How many bunnies did he pack in 1 h? **20**



Problem solving **241**

**Using the Book** Assign the page to be done independently with the children recording the answers in their workbooks.

## OBJECTIVE

To solve word problems using multiplication and division

## RELATED AIDS

HMS—DM68.

## BACKGROUND

See the Chapter Overview.

## SUGGESTIONS

**Initial Activity** Discuss different kinds of factories and what is made in them.

Set up a display of things that are made in different types of factories.

Discuss problems related to factory workers and have the children suggest further problems.

## ACTIVITIES

1. Arrange a visit to a nearby factory.

2. Set up an assembly line and have several children make one item (one part of the assembly per child). Have another group of children make the same item totally by themselves (one item per child).

3. Set up a comparison between something made totally by one person and the same article made by an assembly line of several children.

Compare time, quality, and quantity of results.

4. Use the "Missing Numbers" game in the Activity Reservoir. Modify to match the skills in this section.

5. Distribute DM68.

OBJECTIVE

To evaluate achievement of the chapter objectives

PACING

- Level A All
- Level B All
- Level C All

RELATED AIDS

HMS—DM1 and DM69.

Chapter Test

1.  $4 \times 5 = \blacksquare$  20
2.  $4 \times 10 = \blacksquare$  40
3.  $9 \times 4 = \blacksquare$  36
4.  $3 \times 8 = \blacksquare$  24
5. 
$$\begin{array}{r} 2 \\ \times 8 \\ \hline 16 \end{array}$$
6. 
$$\begin{array}{r} 4 \\ \times 6 \\ \hline 24 \end{array}$$
7. 
$$\begin{array}{r} 5 \\ \times 7 \\ \hline 35 \end{array}$$
8. 
$$\begin{array}{r} 3 \\ \times 7 \\ \hline 21 \end{array}$$
9. 
$$\begin{array}{r} 2 \\ \times 4 \\ \hline 8 \end{array}$$
10. 
$$\begin{array}{r} 4 \\ \times 7 \\ \hline 28 \end{array}$$
11. 
$$\begin{array}{r} 10 \\ \times 8 \\ \hline 80 \end{array}$$
12. 
$$\begin{array}{r} 3 \\ \times 4 \\ \hline 12 \end{array}$$
13. 
$$\begin{array}{r} 0 \\ \times 8 \\ \hline 0 \end{array}$$
14. 
$$\begin{array}{r} 5 \\ \times 6 \\ \hline 30 \end{array}$$
15. 
$$\begin{array}{r} 2 \\ \times 5 \\ \hline 10 \end{array}$$
16. 
$$\begin{array}{r} 3 \\ \times 5 \\ \hline 15 \end{array}$$
17. 
$$\begin{array}{r} 5 \\ \times 9 \\ \hline 45 \end{array}$$
18. 
$$\begin{array}{r} 10 \\ \times 3 \\ \hline 30 \end{array}$$
19. 
$$\begin{array}{r} 4 \\ \times 8 \\ \hline 32 \end{array}$$
20. 
$$\begin{array}{r} 3 \\ \times 9 \\ \hline 27 \end{array}$$
21. 
$$\begin{array}{r} 5 \\ \times 10 \\ \hline 50 \end{array}$$
22. 
$$\begin{array}{r} 2 \\ \times 6 \\ \hline 12 \end{array}$$
23.  $0 \div 8 = \blacksquare$  0
24.  $24 \div 6 = \blacksquare$  4
25.  $16 \div 4 = \blacksquare$  4
26.  $10 \div 2 = \blacksquare$  5
27.  $0 \div 32 = \blacksquare$  0
28.  $25 \div 5 = \blacksquare$  5
29. 
$$\begin{array}{r} 5 \overline{)35} \quad 7 \end{array}$$
30. 
$$\begin{array}{r} 4 \overline{)28} \quad 7 \end{array}$$
31. 
$$\begin{array}{r} 3 \overline{)18} \quad 6 \end{array}$$
32. 
$$\begin{array}{r} 2 \overline{)12} \quad 6 \end{array}$$
33. 
$$\begin{array}{r} 10 \overline{)90} \quad 9 \end{array}$$
34. 
$$\begin{array}{r} 3 \overline{)21} \quad 7 \end{array}$$
35. 
$$\begin{array}{r} 5 \overline{)30} \quad 6 \end{array}$$
36. 
$$\begin{array}{r} 4 \overline{)36} \quad 9 \end{array}$$
37. 
$$\begin{array}{r} 2 \overline{)18} \quad 9 \end{array}$$
38. 
$$\begin{array}{r} 5 \overline{)45} \quad 9 \end{array}$$
39. 
$$\begin{array}{r} 3 \overline{)27} \quad 9 \end{array}$$
40. 
$$\begin{array}{r} 10 \overline{)20} \quad 2 \end{array}$$
41. 10 oranges in each crate.  
8 crates in the store.  
How many oranges altogether? 80
42. 36 marbles in the bag.  
4 children want to share them.  
How many for each child? 9

242 Chapter 8 test

**Using the Book** Each child should do this test independently under supervision. Assistance should be given only when the instructions are not understood. After the work has been corrected, you should provide appropriate remedial work. You may wish to reteach if a large number of children had difficulty with a particular topic or concept.

The following chart will help in this regard. The specific objectives are listed in the Chapter Overview (see page 216).  
An alternate Chapter Test can be found in the Holt Mathematics System Duplicating Masters available for use with this grade level.

| Test Item     | Objective | Text Page Number   |
|---------------|-----------|--------------------|
| 1-42          | A         | 218, 219           |
| 2, 11, 18, 21 | B         | 225                |
| 33, 40        | C         | 233                |
| 29-40         | D         | 227                |
| 23, 27        | E         | 237                |
| 41, 42        | F         | 222, 226, 239, 241 |



# Cumulative Review

## OBJECTIVE

To review and test selected concepts and skills previously covered

Watch the Sign!

- |   |  |  |   |  |
|---|--|--|---|--|
| 1. (a) $\begin{array}{r} 234 \\ + 197 \\ \hline 431 \end{array}$    | (b) $\begin{array}{r} 425 \\ + 334 \\ \hline 759 \end{array}$      | (c) $\begin{array}{r} 542 \\ + 158 \\ \hline 700 \end{array}$    | (d) $\begin{array}{r} 327 \\ + 456 \\ \hline 783 \end{array}$     | (e) $\begin{array}{r} 189 \\ + 346 \\ \hline 535 \end{array}$    |
| 2. (a) $\begin{array}{r} 657 \\ - 423 \\ \hline 234 \end{array}$    | (b) $\begin{array}{r} 968 \\ - 549 \\ \hline 419 \end{array}$      | (c) $\begin{array}{r} 652 \\ - 324 \\ \hline 328 \end{array}$    | (d) $\begin{array}{r} 675 \\ - 458 \\ \hline 217 \end{array}$     | (e) $\begin{array}{r} 351 \\ - 144 \\ \hline 207 \end{array}$    |
| 3. (a) $\begin{array}{r} 234 \\ \times 3 \\ \hline 702 \end{array}$ | (b) $\begin{array}{r} 419 \\ \times 10 \\ \hline 4190 \end{array}$ | (c) $\begin{array}{r} 328 \\ \times 3 \\ \hline 984 \end{array}$ | (d) $\begin{array}{r} 217 \\ \times 5 \\ \hline 1085 \end{array}$ | (e) $\begin{array}{r} 207 \\ \times 4 \\ \hline 828 \end{array}$ |
| 4. (a) $\begin{array}{r} 24 \\ \times 0 \\ \hline 0 \end{array}$    | (b) $\begin{array}{r} 60 \\ \times 3 \\ \hline 180 \end{array}$    | (c) $\begin{array}{r} 15 \\ \times 5 \\ \hline 75 \end{array}$   | (d) $\begin{array}{r} 45 \\ \times 10 \\ \hline 450 \end{array}$  | (e) $\begin{array}{r} 28 \\ \times 0 \\ \hline 0 \end{array}$    |

Divide.

- |                              |                          |                           |                           |                           |
|------------------------------|--------------------------|---------------------------|---------------------------|---------------------------|
| 5. (a) $4 \overline{)24} 6$  | (b) $5 \overline{)30} 6$ | (c) $3 \overline{)24} 8$  | (d) $10 \overline{)80} 8$ | (e) $4 \overline{)36} 9$  |
| 6. (a) $3 \overline{)15} 5$  | (b) $4 \overline{)20} 5$ | (c) $4 \overline{)16} 4$  | (d) $5 \overline{)25} 5$  | (e) $2 \overline{)16} 8$  |
| 7. (a) $2 \overline{)20} 10$ | (b) $3 \overline{)12} 4$ | (c) $10 \overline{)50} 5$ | (d) $4 \overline{)32} 8$  | (e) $5 \overline{)40} 8$  |
| 8. (a) $4 \overline{)40} 10$ | (b) $5 \overline{)35} 7$ | (c) $3 \overline{)30} 10$ | (d) $2 \overline{)14} 7$  | (e) $10 \overline{)90} 9$ |
9. 24 apples.  
4 children want to share.  
How many for each child? **6**
10. One orange has 4 seeds.  
How many seeds are there in  
5 oranges? **20**
11. 3 children want to share  
some peanuts.  
There are no peanuts left.  
How many peanuts for each child? **0**
12. Each peach has 1 seed.  
How many seeds are there  
in 10 peaches? **10**

Chapters 1-8: cumulative review **243**

**Using the Book** This page may be used for diagnostic and remedial as well as review purposes. Children should check their work, correct any errors, and review the pages that contain any problems of the type they missed. Some children can do this on their own while others may need help. If a large number of children have a particular problem incorrect, you may want to reteach that topic to the groups, then assign a duplicated worksheet to reinforce that topic or refer to an appropriate skill card in the BFA Computational Skills Kit I.

| Test Item                       | Text Page Number |
|---------------------------------|------------------|
| 1(a), 1(c), 1(e)                | 52-53            |
| 1(b)                            | 44               |
| 1(d)                            | 48               |
| 2(a)                            | 65-66            |
| 2(b) - 2(e)                     | 67-68            |
| 3(a), 4(b)                      | 220              |
| 3(b), 4(d)                      | 225              |
| 3(c), 3(d), 4(c)                | 223              |
| 3(e)                            | 221              |
| 4(a), 4(e)                      | 171              |
| 5(a), 6(b), 6(c),<br>7(d), 8(a) | 230              |
| 5(b), 6(d), 7(e),<br>8(b)       | 231              |
| 5(c), 6(a), 7(b),<br>8(c)       | 229              |
| 5(d), 7(c)                      | 233              |
| 7(a), 8(d)                      | 228              |
| 9                               | 222              |
| 10, 12                          | 174              |
| 11                              | 237              |

# CHAPTER 9 OVERVIEW

This chapter presents certain basic concepts of geometry: curves, lines, rays, segments, and angles. Slides are introduced. Charts, pictographs, and bar graphs are interpreted and drawn.

## OBJECTIVES

- A To identify and draw closed curves, segments, rays, lines, and angles
- B To identify a slide pattern
- C To read, interpret, and make charts, pictographs, and bar graphs

## BACKGROUND

Geometry can be considered from a qualitative viewpoint or from a quantitative viewpoint. The quantitative aspect is called metric (meaning measurement) geometry while the qualitative aspect is called nonmetric (meaning no measurement) geometry.

Certain nonmetric characteristics of figures are discussed. Curves are classified as either open or closed curves. We do not speak of the length of rays and lines but we may refer to the length of a segment.

Two shapes related by a slide motion are congruent. Corresponding sides of two shapes under a slide are parallel.

## MATERIALS

flannel board  
yarn  
pipe cleaners

paper fasteners  
squared paper — 2 cm squares  
pictographs and bar graphs for demonstration  
pictures of collections of items

### *Bulletin Board*

1. You might ask the children to collect pictographs and bar graphs for displaying.
2. You might ask children to bring pictures of such things as cars, pets, hobbies, and so forth. These can be sorted and mounted to provide suitable data for making tally charts and graphs.

## CAREER AWARENESS

### **Carnival Workers [261]**

Carnival workers are responsible for the operation of the various events at a carnival. The operation falls into three major sections.

The workers set up the tents, displays, rides, games, and concession booths, and take care of any animals.

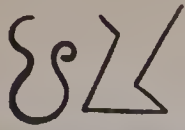
The second aspect involves serving the public that frequents the carnival. The workers must make the public feel they are having a good time.

After the carnival is over, the workers take down and pack all equipment in order to move on to the next centre.

Carnival workers are on the move from one city to another. They must like travelling and being on the move constantly.

# Curves

Open curves



Closed curves



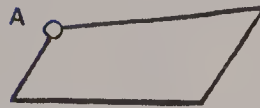
A closed curve ends where it starts.

1. Trace this curve with your finger.



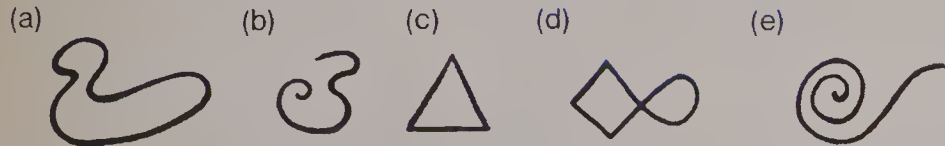
- (a) Does it end where it starts? **no**  
 (b) Does it cross itself? **no**  
 (c) Is it an open or closed curve? **open curve**

2. Trace this curve with your finger.



- (a) Does it end where it starts? **yes**  
 (b) Does it cross itself? **no**  
 (c) Is it an open or closed curve? **closed curve**  
 (b) and (e)

3. Which are open curves? closed curves? (a), (c), and (d)



4. Draw two pictures of each.

- (a) open curves (b) closed curves

Open and closed curves 245

**Using the Book** Use the same procedure as in the Initial Activity only this time have the children draw open and closed curves. Circulate to check progress as the class follows the text. Ask the children to trace each curve as instructed to give them a tactile feel for the various paths. For Exercises 1 and 2 ask, "Is it open or closed?" If you wish to point out that 3(a) is a different type of closed curve than 3(d), emphasize the "Does it cross itself?" question in Exercises 1 and 2; otherwise you may omit this question from each of Exercises 1 and 2.

## OBJECTIVES

To identify open curves and closed curves

To draw an open curve and a closed curve

## PACING

Level A All

Level B All

Level C All

## VOCABULARY

open curves, closed curves

## MATERIALS

flannel board, yarn

## RELATED AIDS

HMS—DM70.

## BACKGROUND

A simple closed curve is a closed curve which does not cross itself. While we do not differentiate at this point, provision is made for identifying this difference by the question "Does it cross itself?" Children can draw curves without lifting their pencils from the paper. A closed curve is formed if the pencil ends at the starting point.

## SUGGESTIONS

**Initial Activity** Using the yarn and flannel board, illustrate open and closed curves. Ask the children to study the two sets to discover what a closed curve is. When they feel that they know what a closed curve is, have them demonstrate how to make one on the flannel board using another piece of yarn.

Repeat this for the open curve.

## ACTIVITIES

1. Use "The Shape Game" and/or the "Sorting Game" in the Activity Reservoir. Modify to match the skills in this section.

2. Ask the children to make a list of paths or curves they see in their classroom or playground.

3. Make a set of cards, each card with a picture of an open curve or a closed curve. Children may play 2 games: (a) Snap and (b) Solitaire — by sorting the cards into the two sets.

## EXTRA PRACTICE

Print the capital letters of our alphabet. Which are open curves? Which are closed curves?



OBJECTIVES

To draw a ray, a line, and a segment  
To identify rays, lines, and segments

PACING

- Level A All
- Level B All
- Level C All

MATERIALS

ruler for drawing segments, lines, and rays

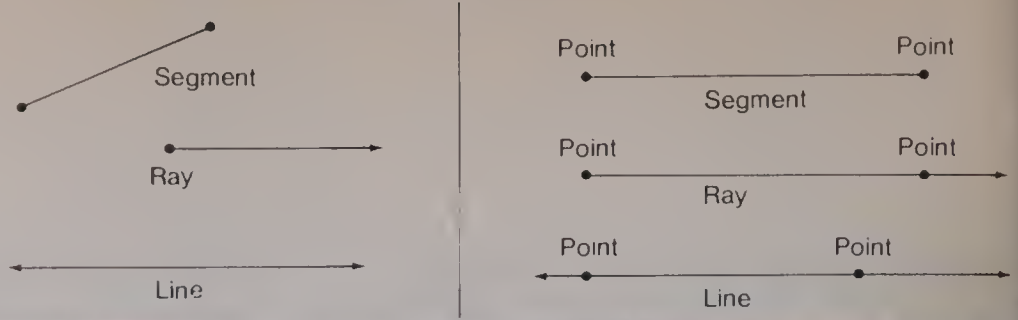
BACKGROUND

A point is a building block in nonmetric (meaning not to do with measurement) geometry. Every geometric figure is an arrangement of a set of points. A segment is straight and has two endpoints. Two points are necessary to draw a segment. Lines have no endpoints; a ray has one endpoint only. Given one point, an infinite number of lines can be drawn through it. Similarly, an infinite number of rays can be drawn from one point. The shortest path between two points is a (line) segment.

ACTIVITIES

- 1. Ask the child to make a list of line segments, rays, and lines that are found in the classroom (or thought of).
- 2. Play the oral game using the sentences: "I am a \_\_\_\_\_; I make you think of a \_\_\_\_\_." As an example the teacher (child) says: "I am a pencil; I make you think of a \_\_\_\_\_." The other children have to name the geometric shape that completes the sentence. Also "I am a flyspcck on the window; I make you think of a \_\_\_\_\_ (point)."
- 3. Unscramble.  
metseng (segment)  
ayr (ray)  
neil (line)  
tonip (point)  
reveu (curve)  
nope (open)

Segments, Rays, and Lines



A ray goes on forever in one direction only.  
A line goes on forever in both directions.

- 1. Which are segments? (a), (c), and (e)  
(a) [diagram] (b) [diagram] (c) [diagram] (d) [diagram] (e) [diagram] (f) [diagram]
- 2. Which are lines? rays? lines: (a), (d), and (e); rays: (b) and (c)  
(a) [diagram] (b) [diagram] (c) [diagram] (d) [diagram] (e) [diagram]
- 3. Which are rays? segments? rays: (b), (c), (d), and (e); segments: (a) and (f)  
(a) [diagram] (b) [diagram] (c) [diagram] (d) [diagram] (e) [diagram] (f) [diagram]
- 4. Match.  
(a) Line (iii) (i) goes on forever in one direction only  
(b) Ray (i) (ii) has two endpoints  
(c) Segment (ii) (iii) goes on forever in both directions
- 5. Draw 3 rays. 6. Draw 3 segments. 7. Draw 3 lines.

246 Segments, points, lines, and rays

**Using the Book** Discuss the display. Ask how segments differ from rays and lines. Ask what is at each end of a segment. (endpoints or points) Ask how many endpoints a segment has. (2) Ask how a ray differs from a segment. (Bring out that a ray has only one endpoint and it goes on forever in one way or direction.) Then ask how a line differs from a ray. (A line has no endpoint and goes on forever in both directions.)  
Make certain that children understand the arrow is used to indicate the line goes on forever in that direction by asking first, "How do we show that a line goes on forever?" and later, "What does an arrow show on a line like this  $\longleftrightarrow$  ?"

# Tune Up

- Start at 14 and count by twos to 60. 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60
- Start at 6 and count by threes to 33. 6, 9, 12, 15, 18, 21, 24, 27, 30, 33
- Start at 80 and count by fives to 150. 80, 85, 90, 95, 100, 105, 110, 115, 120, 125, 130, 135, 140, 145, 150
- Start at 50 and count by tens to 150. 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150
- Start at 100 and count by hundreds to 900. 100, 200, 300, 400, 500, 600, 700, 800, 900

Add.

|   |   |   |   |   |
|---|---|---|---|---|
| 6. $\begin{array}{r} 32 \\ + 7 \\ \hline 39 \end{array}$      | 7. $\begin{array}{r} 346 \\ + 8 \\ \hline 354 \end{array}$    | 8. $\begin{array}{r} 428 \\ + 141 \\ \hline 569 \end{array}$  | 9. $\begin{array}{r} 436 \\ + 151 \\ \hline 587 \end{array}$  | 10. $\begin{array}{r} 575 \\ + 173 \\ \hline 748 \end{array}$ |
| 11. $\begin{array}{r} 634 \\ + 126 \\ \hline 760 \end{array}$ | 12. $\begin{array}{r} 278 \\ + 416 \\ \hline 694 \end{array}$ | 13. $\begin{array}{r} 269 \\ + 163 \\ \hline 432 \end{array}$ | 14. $\begin{array}{r} 154 \\ + 167 \\ \hline 321 \end{array}$ | 15. $\begin{array}{r} 299 \\ + 222 \\ \hline 521 \end{array}$ |

Subtract.

|  |  |   |   |   |
|--|--|---|---|---|
| 16. $\begin{array}{r} 36 \\ - 12 \\ \hline 24 \end{array}$ | 17. $\begin{array}{r} 47 \\ - 23 \\ \hline 24 \end{array}$ | 18. $\begin{array}{r} 356 \\ - 112 \\ \hline 244 \end{array}$ | 19. $\begin{array}{r} 516 \\ - 203 \\ \hline 313 \end{array}$ | 20. $\begin{array}{r} 168 \\ - 54 \\ \hline 114 \end{array}$  |
| 21. $\begin{array}{r} 23 \\ - 18 \\ \hline 5 \end{array}$  | 22. $\begin{array}{r} 36 \\ - 29 \\ \hline 7 \end{array}$  | 23. $\begin{array}{r} 333 \\ - 156 \\ \hline 177 \end{array}$ | 24. $\begin{array}{r} 231 \\ - 146 \\ \hline 85 \end{array}$  | 25. $\begin{array}{r} 300 \\ - 167 \\ \hline 133 \end{array}$ |

Add.

|  |  |  |  |  |
|--|--|--|--|--|
| 26. $\begin{array}{r} \$1.47 \\ + 1.21 \\ \hline \$2.68 \end{array}$ | 27. $\begin{array}{r} \$6.25 \\ + 1.80 \\ \hline \$8.05 \end{array}$ | 28. $\begin{array}{r} \$3.64 \\ - 1.03 \\ \hline \$2.61 \end{array}$ | 29. $\begin{array}{r} \$8.77 \\ - 2.53 \\ \hline \$6.24 \end{array}$ | 30. $\begin{array}{r} \$5.67 \\ - 4.10 \\ \hline \$1.57 \end{array}$ |
|--|--|--|--|--|

Subtract.

Practice 247

**Using the Book** If the child has unusual difficulty with this page you may provide appropriate remedial work specific to the type of difficulty encountered. It is suggested this page be assigned over two different days. You may wish to assign Exercises 1-10 and 16-20 one day, allowing the children to do the assigned exercises and to correct them. Then introduce and assign pages 248 and 249. On the following day assign the balance of page 247 and do page 250.

## OBJECTIVES

- To review counting by 2's, 3's, 5's, 10's, and 100's
- To review addition and subtraction with regrouping
- To review addition and subtraction with money
- To maintain speed and accuracy in computational skills

## PACING

- Level A All
- Level B All
- Level C 11-15, 21-30

## ACTIVITIES

Use the "Shuffle Numbers" game and/or the "Shape Pictures" game in the Activity Reservoir. Modify to match the skills in this section.

## EXTRA PRACTICE

|   |   |
|---|---|
| 1. $\begin{array}{r} 341 \\ + 429 \\ \hline \end{array}$        | 2. $\begin{array}{r} 568 \\ + 207 \\ \hline \end{array}$        |
| 3. $\begin{array}{r} 760 \\ + 239 \\ \hline \end{array}$        | 4. $\begin{array}{r} 423 \\ + 207 \\ \hline \end{array}$        |
| 5. $\begin{array}{r} 518 \\ + 209 \\ \hline \end{array}$        | 6. $\begin{array}{r} 630 \\ + 322 \\ \hline \end{array}$        |
| 7. $\begin{array}{r} 145 \\ + 59 \\ \hline \end{array}$         | 8. $\begin{array}{r} 345 \\ + 206 \\ \hline \end{array}$        |
| 9. $\begin{array}{r} 486 \\ + 79 \\ \hline \end{array}$         | 10. $\begin{array}{r} 56 \\ + 432 \\ \hline \end{array}$        |
| 11. $\begin{array}{r} 851 \\ - 432 \\ \hline \end{array}$       | 12. $\begin{array}{r} 623 \\ - 302 \\ \hline \end{array}$       |
| 13. $\begin{array}{r} 404 \\ - 123 \\ \hline \end{array}$       | 14. $\begin{array}{r} 700 \\ - 253 \\ \hline \end{array}$       |
| 15. $\begin{array}{r} 716 \\ - 246 \\ \hline \end{array}$       | 16. $\begin{array}{r} 643 \\ - 259 \\ \hline \end{array}$       |
| 17. $\begin{array}{r} 840 \\ - 237 \\ \hline \end{array}$       | 18. $\begin{array}{r} 434 \\ - 306 \\ \hline \end{array}$       |
| 19. $\begin{array}{r} 239 \\ - 69 \\ \hline \end{array}$        | 20. $\begin{array}{r} 708 \\ - 89 \\ \hline \end{array}$        |
| 21. $\begin{array}{r} \$72.50 \\ + 16.40 \\ \hline \end{array}$ | 22. $\begin{array}{r} \$64.21 \\ + 23.98 \\ \hline \end{array}$ |
| 23. $\begin{array}{r} \$18.41 \\ - 9.46 \\ \hline \end{array}$  | 24. $\begin{array}{r} \$57.63 \\ - 25.89 \\ \hline \end{array}$ |



## OBJECTIVES

To introduce the concept of angle  
To recognize angles  
To draw angles

## PACING

Level A All  
Level B All  
Level C All

## MATERIALS

pipe cleaners and/or strips of paper  
and paper fastener

## RELATED AIDS

HMS—DM71.

## BACKGROUND

Mathematically, angles may be defined as the union of two rays with a common endpoint. This concept, while not presented formally, will be developed over the period of several years.

## SUGGESTIONS

**Initial Activity** Form an angle using the pipe cleaners or the paper strips fastened at one end with the paper fastener. Discuss with the child how the paper strips can better be made to represent rays (cut the ends to represent arrows or twist pipe cleaner to form arrowhead).



## ACTIVITIES

1. Play the oral game introduced for the lesson on page 246. "I am the legs of a man; I make you think of \_\_\_\_\_ (an angle)."

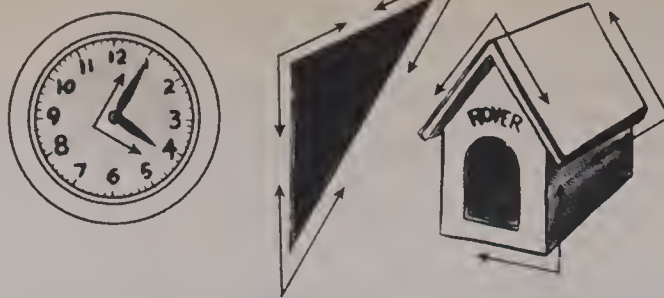
In the gymnasium have the children represent angles in as many ways as they can — using arms, legs, bent at waist, and so on.

2. Use the "Sorting Game" in the Activity Reservoir. Modify to match the skills in this section.

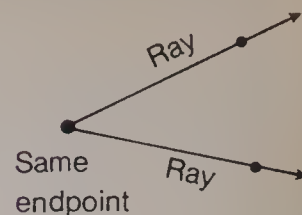
3. Have the children draw a picture and colour it. Then they should mark the angles using ink as in Exercise 1, page 248.

## Angles

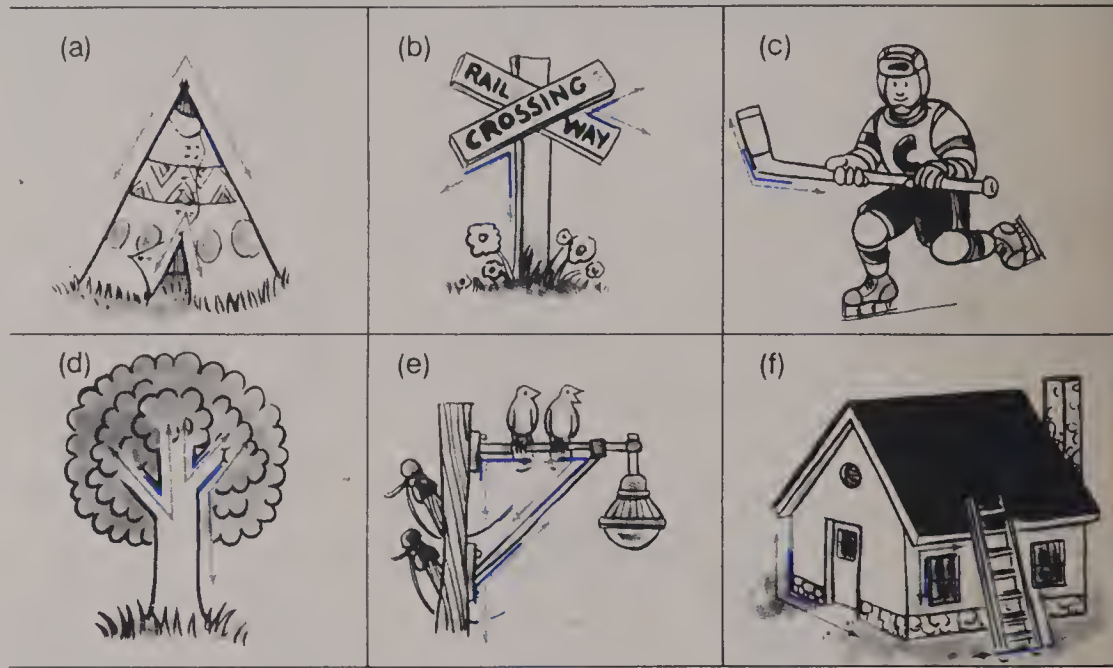
Examples of angles



Drawing an angle.



1. Trace the angle in each.



248 Angles

**Using the Book** Do this page in conjunction with page 247. See Using the Book, page 247.

Discuss the displays. The children should have an intuitive idea of angles already. With the above activity, the idea of two rays with the same endpoint should be readily accepted. Remind the child that we can't draw the whole angle since each arm goes on and on forever.

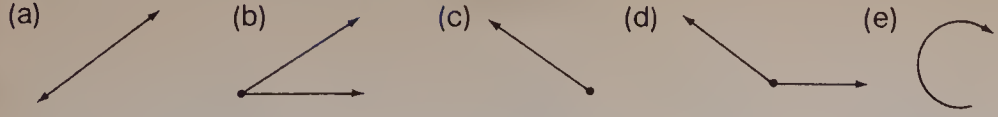
Assign Exercises 1 and 2. Provide the child with suitable paper for tracing the angles. Then move about the classroom to check on each child.

Discuss Exercise 3 in the class. The child should tell you why one suggests angles and others don't. They might trace the angles with their finger.

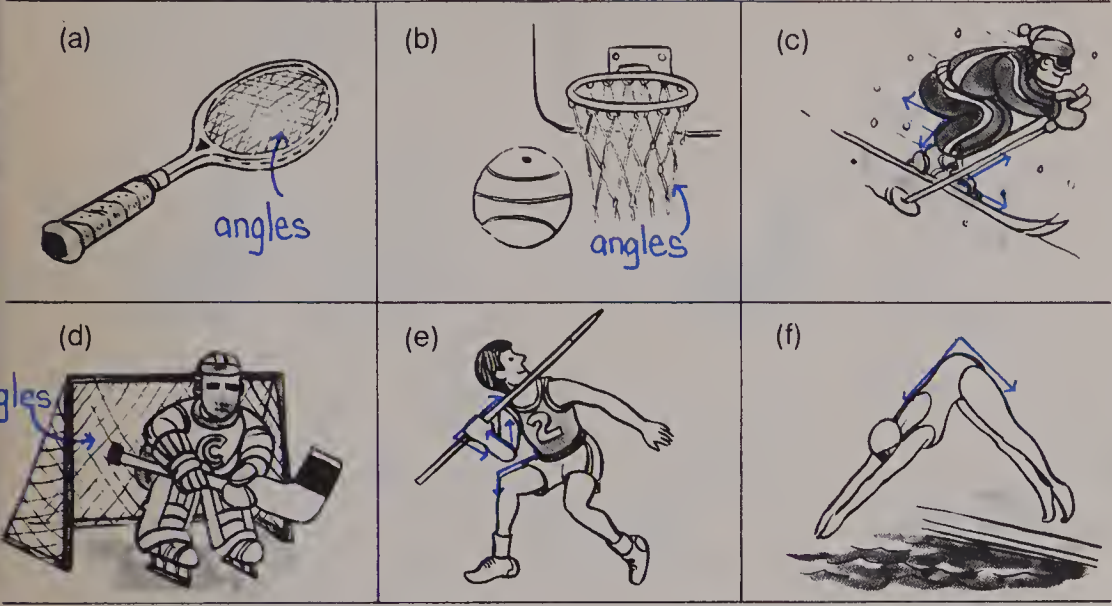
Assign Exercises 4 and 5. Discuss. Ask what an angle looks like. Then have the child make the angle into a picture.



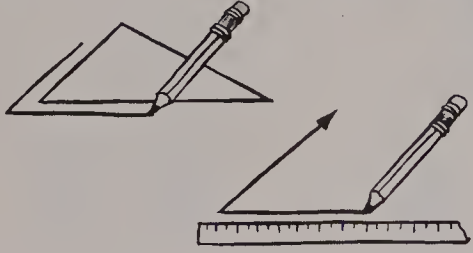
2. Which are angles? (b) and (d)



3. Which remind you of angles? Tell why. they all do



4. Cut out a triangle.  
Trace all the angles.  
How many are there? 3



5. Use a ruler. Draw an angle.

## OBJECTIVE

To identify slides

## PACING

Level A All  
Level B All  
Level C All

## MATERIALS

squared paper: 2 cm squares, scissors and paper, crayons

## RELATED AIDS

HMS—DM72.

## BACKGROUND

In representing a slide, caution must be taken to see that there is *no turning* of the object. At this time, this can be achieved by having the child slide the object along lines or by drawing a base line on the bottom of a shape.

The object and the image (the tracing) are the same size and shape. We are building to the concept of congruence.

Slides are called *translations* in mathematics.

## SUGGESTIONS

**Initial Activity** Discuss the past experiences the children have had with slides of various kinds. The display will start them thinking.

Give children objects such as attribute blocks. Ask them to slide the blocks along the edge of their desks *without* turning them. Tell the children they are “sliding” the blocks. Encourage the children to slide the blocks in all directions (horizontally, vertically, diagonally).

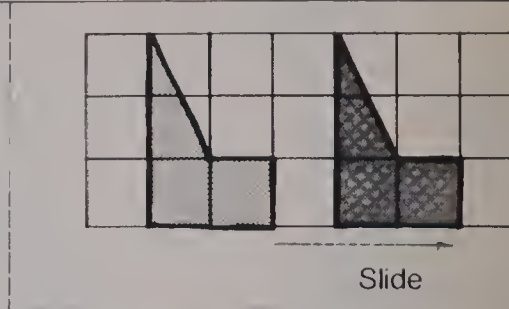
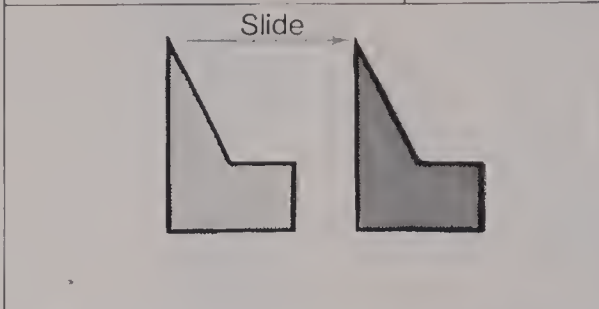
## ACTIVITIES

An art exercise of making patterns using slides will reinforce the math lesson. Ask the child to make a wallpaper pattern using different shapes such as a leaf or a flower:

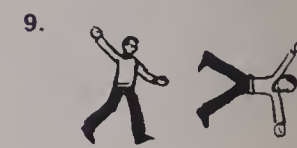
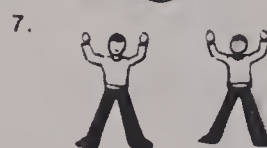
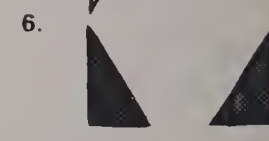
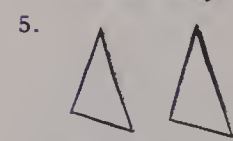
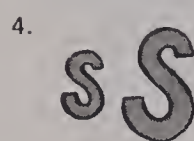
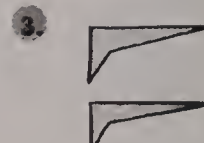
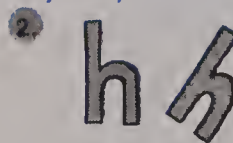
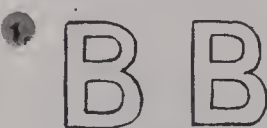


Squared paper may be used as background paper. Trace a cardboard leaf or flower shape, slide it to the next square, and trace it. Repeat in all squares.

## Slides



Which show slides? (1), (3), (5), and (7)



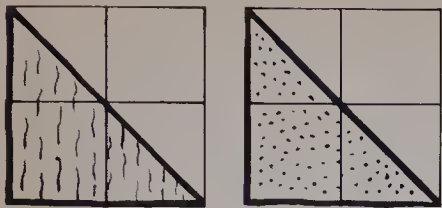
250 Slides

**Using the Book** Discuss the top three illustrations in the display. Then ask the children how the shape is moved in each display. (It slides.) Then provide paper and scissors to make a shape, trace around it, slide it, and trace it again. Repeat for different patterns. Colour. Use the squared paper to trace on. Slide the shape in various directions.

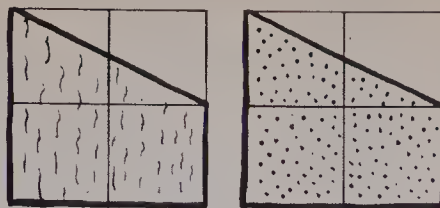
Discuss with the child that each shape is the same size and shape as the object traced.

Discuss which pictures show slides in Exercises 1-9. Ask the children to explain why or why not a pattern is a slide.

# The Same Shapes

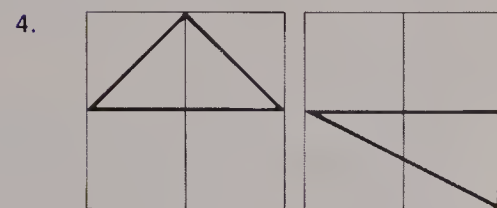
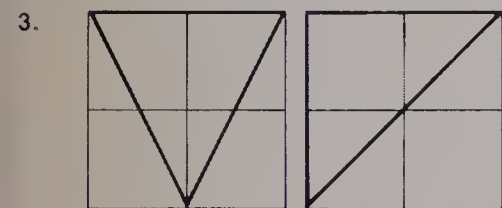
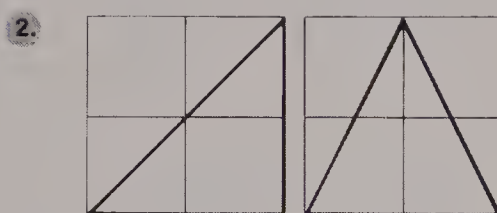
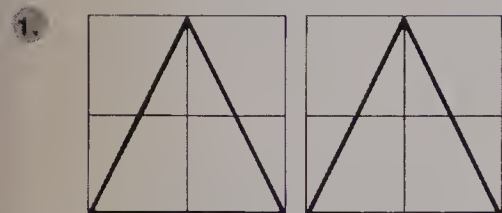


The same shapes



The same shapes

Which shapes are the same? (1) and (5)



Drawing repeating shapes on squared paper and dot paper 251

**Using the Book** Discuss each half of the display asking, "How is the first shape like the second shape? (same size, same shape, not turned)" Ask, "How do you know the shapes are the same size? (two squares high, two squares long, etc.)"

Do the exercises orally, asking the children how they know the shapes are or are not the same. Some children will be able to explain easily while others may find it more difficult. The discussion should help the children to clarify their ideas about congruency.

## OBJECTIVE

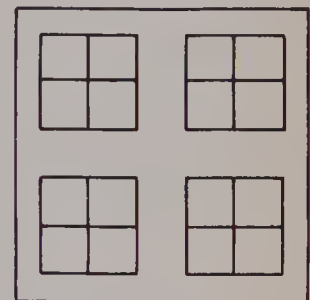
To identify shapes which are the same (congruent)

## PACING

Level A All  
Level B All  
Level C All

## MATERIALS

squared paper: 2 cm × 2 cm  
You may wish to duplicate a page with a set of 2 × 2 squares as indicated.



## RELATED AIDS

HMS—DM25, DM26, and DM72.

## BACKGROUND

The page is preparation for congruence. Two shapes are congruent if they have the same shape and the same size. It also provides preparation for the co-ordinate system. Intuitively the child will relate position as 1 down, 1 over, the middle, etc.

## ACTIVITIES

1. Draw these shapes on the chalkboard using a square grid. Ask the child to copy the shape on a blank grid. (See the duplicated sheet in Materials.)

2. In art the child can draw repeating shapes on squared paper. This differs from the previous art lesson in that in this one the child draws — does not trace — the repeating shape. Coloured patterns may produce an attractive wall display.

3. Use "The Shape Game" in the Activity Reservoir.



## OBJECTIVES

To write number sentences for problems

To solve number sentences

## PACING

Level A All

Level B All

Level C All

## SUGGESTIONS

**Initial Activity** Discuss a country fair. Ask the children what they would expect to see at a country fair.

## ACTIVITIES

1. Prepare word problems similar to those from this page, and put them on envelopes. Prepare answer cards bearing the appropriate number sentences to solve the word problems. The task is to sort and place the correct number sentences in the correct envelopes. Have another child check.

2. Ask the children to draw and colour a picture "The Country Fair". Then they can write a story problem about the fair.

3. Ask each child to make up one word problem accompanied by a drawing illustrating the problem. The children exchange problems. The best problems and solutions may be posted on the bulletin board.

## EXTRA PRACTICE

1. Mike's pumpkin was 74 cm around.  
Henry's pumpkin was 96 cm around.  
How much bigger was Henry's pumpkin?
2. Bertha's calf sold for \$275.  
Gracie's calf sold for \$198.  
How much more did Bertha get?
3. Darcy's rooster sold for \$2.75.  
Kelly's rooster sold for \$3.10.  
How much did the two roosters sell for?
4. Candy floss was 35¢ each.  
Mr. Lopez bought 4 of them.  
How much did Mr. Lopez pay?

## The Country Fair



Write a number sentence to solve each mystery.

- |   |   |
|---|---|
| 1. Cowboy straw hat \$3.25<br>Cowboy belt \$4.60<br>Total cost? <b>\$7.85</b>                           | 2. Ride on ferris wheel 55¢<br>Ride on roller coaster 65¢<br>Total cost? <b>\$1.20</b>                        |
| 3. Mary's calf is 213 kg.<br>Billy's calf is 208 kg.<br>How much more is Mary's calf? <b>5 kg</b>       | 4. Mary's calf is 120 cm tall.<br>Billy's calf is 95 cm tall.<br>How much taller is Mary's calf? <b>25 cm</b> |
| 5. Kim's rose is 18 cm wide.<br>Ray's rose is 16 cm wide.<br>How much bigger is Kim's rose? <b>2 cm</b> | 6. Marco's rooster is 4 kg.<br>Marco's duck is 8 kg.<br>How much heavier is the duck? <b>4 kg</b>             |
| 7. Pierre sold honey at \$1.85 for each litre.<br>How much did he get for 2 L? <b>\$3.70</b>            | 8. José's sheep are 44 kg and 39 kg.<br>How heavy are the two sheep together? <b>83 kg</b>                    |

252 Addition and subtraction problems

**Using the Book** Do the first problem together as a class activity. Ask what the problem is about. (cowboy hat and belt) Then ask what facts we know. (cost of hat and belt) Ask what the problem requires. (cost of the two items) What operation do we use? (+) Then ask how to write a number sentence to show the cost. ( $\$3.25 + \$4.60 = \blacksquare$ ) You may use  $\blacksquare$  or  $\underline{\hspace{1cm}}$  or  $n$ . Have a child tell what number replaces the box ( $\blacksquare$ ). Remind the child that the box or blank or  $n$  simply indicates a placeholder for the answer. The children should record the number sentence and solution in their workbooks.

Repeat the above procedure for as many exercises as required. Then direct the children to do the remaining exercises in their workbooks.

# A Chart and Problems

We can obtain information by reading charts.

| World's Largest Fish |          |             |                  |
|----------------------|----------|-------------|------------------|
| Type or Name         | Country  | Year Caught | Length in Metres |
| <i>Saltwater</i>     |          |             |                  |
| Whale Shark          | Siam     | 1919        | 19               |
| Great White Shark    | Canada   | 1930        | 11               |
| <i>Freshwater</i>    |          |             |                  |
| Catfish              | Russia   | 1918        | 4                |
| Pla                  | Thailand | —           | 2                |

- Which saltwater fish was longer? *whale shark*
- Which freshwater fish was longer? *catfish*
- How much longer was the whale shark than the great white shark?
  - How long is the whale shark? *19m*
  - How long is the great white shark? *11m*
  - Subtract:  $19 - 11 = \blacksquare$  *8*
- How much longer is the catfish than the pla? *2m*
- How long would the two sharks be if placed end to end? *30m*
- How long would the two freshwater fish be if placed end to end? *6m*
- In which year was the catfish caught? *1918*
- In what country was the pla caught? *Thailand*

Problem solving, reading charts 253

**Using the Book** Ask, "What is the chart about?" "What fish are described?" "What information is given? (name of fish; country and year the fish was caught; length of the fish in metres)" Note that the year the pla was caught is not known.

Do Exercises 1, 2, and 3 orally. Then assign the remaining exercises.

## OBJECTIVE

To solve problems by finding information in a chart

## PACING

Level A All  
Level B All  
Level C All

## VOCABULARY

information, saltwater, freshwater, pla

## SUGGESTIONS

**Initial Activity** Show the class a picture of a large shark. Discuss what they think the size might be.

The child may claim the whale is larger than a shark. If this happens tell the child that a whale is not a fish. It is a mammal. You may want to teach a little science here if this topic arises.

## ACTIVITIES

- If some children express an interest, ask them to prepare reports on large fish.
- Ask the children to write a brief report on sharks dealing with their sizes, how long they live, etc.
- Ask some children to mark out on the hall floor, how long the largest shark was.



## OBJECTIVES

- To read and interpret the tally system and graphs
- To make a tally system
- To make a graph using squares

## PACING

- Level A All
- Level B All
- Level C All

## MATERIALS

several simple bar graphs for display, a set of pictures similar to those in Exercise 2, squares for child graphs

## SUGGESTIONS

**Initial Activity** Display several simple bar graphs and ask what kind of things we can learn from reading them. Emphasize that bar graphs usually provide information like how much or how many.

Ask why a bar graph would be made instead of a list of numbers. (Point out that it is easier to compare the facts and information.)

## ACTIVITIES




1. Display a set of pictures as in Exercise 2. Ask the child to make tally marks and a bar graph using squares to tell the story about how many.

2. Ask the child to collect and display graphs and sets of pictures for which graphs can be made (i.e., flowers, birds, trees).

3. Use a tally system to record the colour of eyes of children in the class. Use squares to make a graph to show the information.

## Keeping Track

Kelly made a mark for each tree on his street.

Oak        
 Maple      
 Elm      

Tally System

Kelly made a graph.

He used one square for each tree.

Oak        
 Maple      
 Elm      

Graph

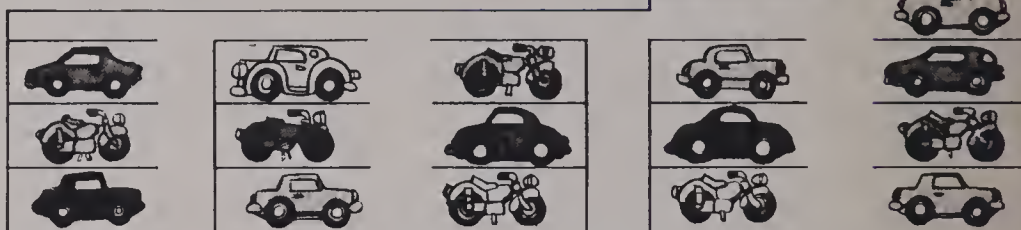
Refer to the above.

- How many tally marks did Kelly make for the  
 (i) oak? 8    (ii) maple? 11    (iii) elm? 6
- How many squares were used for the oak trees? 8
- How many squares were used for the maple trees? 11
- How many squares were used for the elm trees? 6

2. This shows a parking lot.

- Use the tally system to show the number of motorcycles, cars, and buses.

- Use squares to make a graph to show the information.
- Label your graph.



254 Tally system and squares for graphing

**Using the Book** Discuss the Tally System in the display. Ask, "What does each tally mark or stroke represent?" "How many oak on Kelly's street?" Discuss the Graph in the display. Ask, "What does each square represent?" "How many maple are there?" Point out that it is easier to tell the most or the least from a bar graph than from a list of numbers.

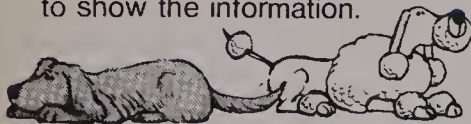
Do Exercise 1 orally. This is a check to see if the children are able to interpret appropriately.

Assign Exercise 2. Ask the children to make a tally mark for each car. Emphasize that for easy counting we always make 4 with 1 across the 4 (total 5). Then we can count in fives. Ask them to check by counting the number of tally marks and the number of cars. Do the answers agree? Instruct them to complete the exercises. Discuss all the children's answers.

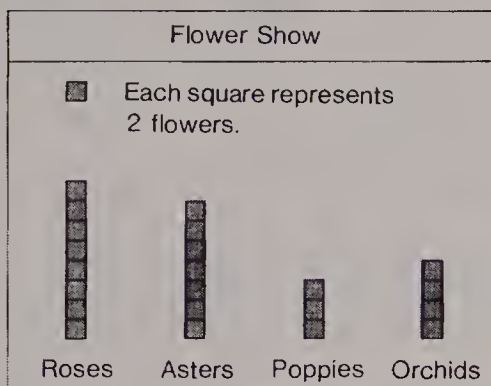


3. (a) How many kinds of dogs? **4**  
 (b) How many of each kind?  
 (c) Of what kind were there the most? **collies**  
 (d) Of what kind were there the least? **beagles**  
 (e) How many dogs altogether? **51**  
 (f) Show the tally for 18 dogs. **|||| ||| ||| ||| |||**  
 (g) Use squares to make a graph to show the information.

| Dogs at the Dog Show      |                |
|---------------------------|----------------|
| Type                      | Number of Dogs |
| Collies <b>21</b>         |                |
| Poodles <b>13</b>         |                |
| Beagles <b>4</b>          |                |
| Cocker Spaniels <b>13</b> |                |



4. (a) How many flowers does each square stand for? **2**  
 (b) How many asters were there? **14**  
 (c) How many orchids were there? **8**  
 (d) Of what kind were there the most? **roses**  
 (e) How many flowers were in the show altogether? **44**  
 (f) How would you graph 12 sweet peas? **with 6 squares**



## BRAINTICKLER

|   |   |   |
|---|---|---|
| 1 | 2 | 3 |
| 4 | 5 | 6 |
| 7 | 8 | 9 |

How many more can you find?

Pile 9 boxes in 3 stacks of 3.  
 No box can have a number smaller than its own below it or to the right.  
 One way is shown.

|   |   |   |
|---|---|---|
| 1 | 4 | 7 |
| 2 | 5 | 8 |
| 3 | 6 | 9 |

## OBJECTIVE

To read and interpret pictographs

## PACING

Level A 1, 2

Level B All

Level C All

## VOCABULARY

pictograph, gymnastic

## MATERIALS

pictographs for display

## BACKGROUND

Display the word "pictograph".

Ask the child what two words were combined to make this word.


Point out that a pictograph is a graph which uses pictures to provide facts or information about how much, how many, how big, which is the most, which is the least, etc.

## ACTIVITIES

1. Make and display pictographs showing:

- birthdays per month.
- attendance per month this year.
- number of children with different pets: rabbits, dogs, cats, etc.

2. Prepare a large pictograph for discussion.

| How Children Come to School  |         |                    |
|--|---------|--------------------|
|  | Ways    | Number of Children |
| <br>means<br>5<br>children | Walk    |                    |
|  | Bicycle |                    |
|  | Bus     |                    |
|  | Car     |                    |

## EXTRA PRACTICE

Multiply.

- $2 \times 5$
- $4 \times 3$
- $3 \times 5$
- $5 \times 5$
- $0 \times 3$
- $4 \times 0$
- $9 \times 5$
- $7 \times 3$
- $8 \times 1$
- $6 \times 4$
- $10 \times 2$
- $8 \times 5$
- $8 \times 3$
- $6 \times 0$
- $9 \times 4$

Divide.

- $10 \div 5$
- $40 \div 4$
- $32 \div 4$
- $18 \div 3$
- $0 \div 10$
- $45 \div 5$
- $24 \div 4$
- $21 \div 3$

24. There were 45 marbles.

Five children shared them.



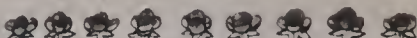

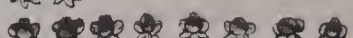
How many marbles for each child?

25. Each apple has 6 seeds.




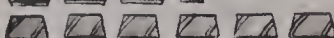

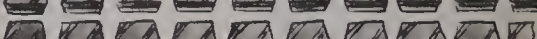
How many seeds in 5 apples?

## Reading Pictographs






Graphs tell facts. These are **pictographs**.

| Roses in Children's Gardens   |        |   |
|---|--------|---|
|   | Name   | Number of Roses   |
| Each symbol<br> means<br>1 rose. | Shawn  |  |
|   | Cheryl |  |
|   | Michie |  |
|   | Jennie |  |

The Gymnastic Club has a sale of chocolates to raise funds.

| Sale of Boxes of Chocolates   |       |   |
|---|-------|---|
|   | Name  | Number of Boxes Sold  |
|  means<br>2 boxes of chocolates. | Hilda |  |
|   | Frank |  |
|   | Myra  |  |
|   | Fred  |  |
|   | Bob   |  |

The Ice-Cream Shop recorded the kinds of ice cream sold.

| Flavours of Ice Cream Sold   |            |   |
|--|------------|---|
|  | Flavour    | Number of Cones Sold  |
|  means<br>10 ice-cream<br>cones. | Strawberry |  |
|  | Chocolate  |  |
|  | Pineapple  |  |
|  | Vanilla    |  |

256 Pictographs

**Using the Book** 1. Ask the child, "What does the symbol in Exercise 1 mean?" "Why is that symbol used instead of a box? (It looks like a rose.)" "What does the symbol in Exercise 3 look like?" "What do you think the information in Exercise 3 is about?" "What symbol would you use to Make a pictograph for Exercises 2, 3, and 4 on pages 254 and 255?"

2. "How does the symbol in Exercise 1 differ from the symbol in Exercise 2? (In Exercise 2, each symbol means 2 boxes while in Exercise 1 each symbol means 1 rose.)" Point out that there is always a statement that tells *what* and *how many* the symbol represents.



3. Ask what a half symbol represents in Exercise 2, in Exercise 3. You may wish to do pages 256 and 257 orally, asking children in turn to give the answers to the questions. Work with small groups.

Put the Extra Practice on the chalkboard for children to work on while you are working with small groups.



1. Roses in Children's Gardens

- (a) How many roses does each symbol stand for? 1
- (b) How many roses does Shawn have? 6
- (c) Who has the most roses? Cheryl
- (d) Who has the fewest roses? Michie
- (e) How would you show 12 roses? with 12 flower symbols
- (f) What does the graph tell us? the number of roses in each child's garden

2. Sale of Boxes of Chocolates

- (a) What is the pictograph about? the number of boxes of chocolates each child sold
- (b) How many boxes does the symbol  stand for? 2
- (c) How many boxes does the symbol  stand for? 1
- (d) How many boxes did each person sell? Hilda: 15; Frank: 7; Myra: 12; Fred: 22; Bob: 19
- (e) Who sold the most boxes? the least? most: Fred; least: Frank
- (f) How many boxes were sold altogether? Find this in two ways. 75

3. Flavours of Ice Cream Sold

- (a) What is the graph about? the number of ice-cream cones of each flavour sold
- (b) How many cones does the symbol  stand for? <sup>10</sup> the symbol  ? <sup>5</sup>
- (c) How many strawberry ice-cream cones were sold? pineapple? vanilla? 110; 155; 45
- (d) What flavour was most popular? least? most popular: pineapple; least popular: vanilla
- (e) How many cones were sold altogether? How many ways can you find this answer? 390; 2
- (f) How would the graph help the owner of the ice-cream shop? The graph would give the owner an idea of what quantity of each flavour to buy.





OBJECTIVE

To read and interpret bar graphs using the scales 1-1, 1-2, and 1-5

PACING

- Level A All
- Level B All
- Level C All

VOCABULARY

bar graph

MATERIALS

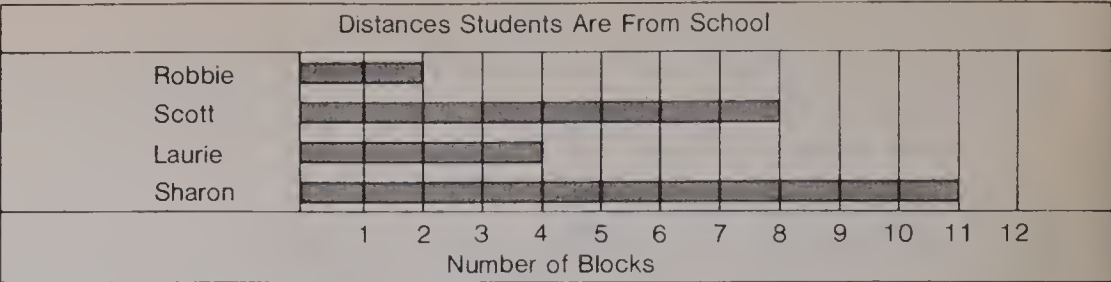
for display and additional activities:  
bar graphs with the scales under study

ACTIVITIES

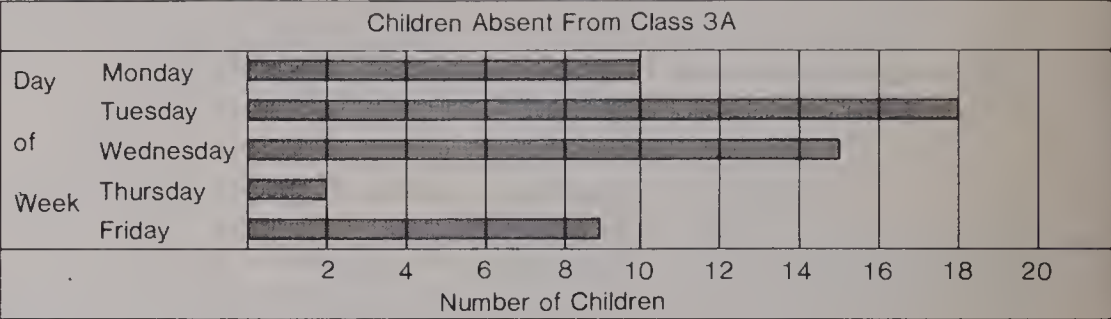
1. Ask the child to make up questions about a bar graph on display (see Materials above).  
Give the questions to the other class members.  
Ask the child who made up the questions to put the answers on the display board.
2. You may have the children keep a record of test scores for a subject (math, spelling, etc.) on a bar graph.

The Bar Graph

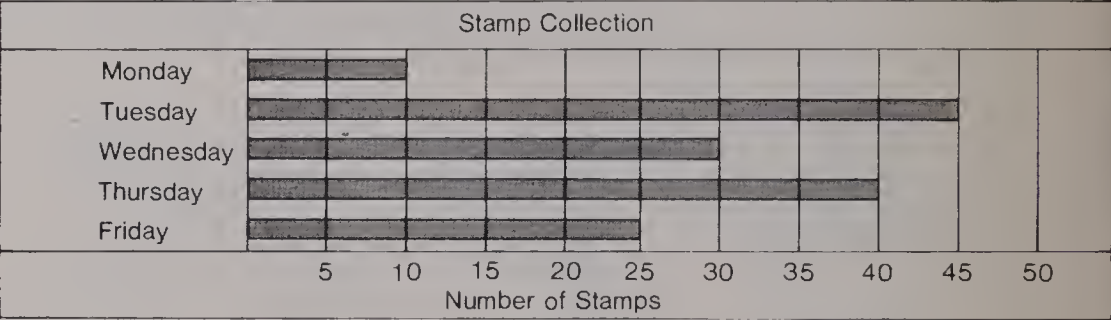
A bar graph gives information.



The flu hit class 3A one week.



Class 3B had a stamp collecting campaign.



**Using the Book** These pages are to provide extended practice in reading and interpreting graphs. Emphasize that the number scale along one side is used instead of squares or pictures that were used on pages 254 to 257.

Ask how the number line in the graph in Exercise 1 differs from the number line in Exercise 2, in Exercise 3. (In Exercise 1 each line represents 1, in Exercise 2 each line represents 2, and in Exercise 3 each line represents 5.)

Emphasize that bar graphs provide information quickly about the least and the most. You may wish to do pages 258 and 259 orally, working with small groups where each child gets ample opportunity to reply to questions. While you are working with a group, the other children may engage in Activities listed on this and previous pages or some children may benefit from additional practice in computational skills at the back of the textbook.

1. Distances Students Are From School

- (a) What is this graph about? *the number of blocks students are from school*
- (b) What are the names of the students? *Robbie, Scott, Laurie and Sharon*
- (c) Who is the farthest from school?

Pick the longest bar.

Follow it to the name on the left. *Sharon*

- (d) Who is the closest to school? *Robbie*
- (e) How far is Scott from school?

Follow the bar from the name Scott to the right end.

What line does it end on? *8 blocks*

- (f) How far is Laurie from school? *4 blocks*

2. Children Absent From Class 3A

- (a) What is the graph about? *the number of children absent from Class 3A one week*
- (b) Where is the scale shown? How is the scale marked? *across the bottom, by 2's*
- (c) Where are the days shown? *down the left side*
- (d) How many children were absent Monday? Wednesday? Friday? *10, 15, 9*
- (e) On which day were the most children absent? *Tuesday*
- (f) On which day were the fewest children absent? *Thursday*

3. Stamp Collection

- (a) What is the graph about? *the number of stamps Class 3B collected each day*
- (b) On which days were the stamps collected? *Monday, Tuesday, Wednesday, Thursday, and Friday.*
- (c) How is the scale marked? *by 5's*
- (d) How many stamps were collected on Tuesday? Friday? *45, 25*
- (e) On which day were the most stamps collected? the fewest? *most: Tuesday; fewest: Monday*

## OBJECTIVE

To read and interpret bar graphs with large scales — 1-10 and 1-50

## PACING

Level A 1  
Level B All  
Level C All

## MATERIALS

for display and additional activities:  
bar graphs using the scales listed in the Objective

## SUGGESTIONS

**Initial Activity** Review counting by tens and fifties.

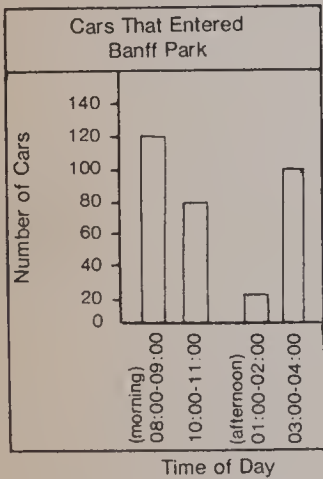
## ACTIVITIES

Ask the child to make up questions about a bar graph on display (see Materials above).

Give the questions to other children.

Ask the child who made up the questions to write the answers on the chalkboard.

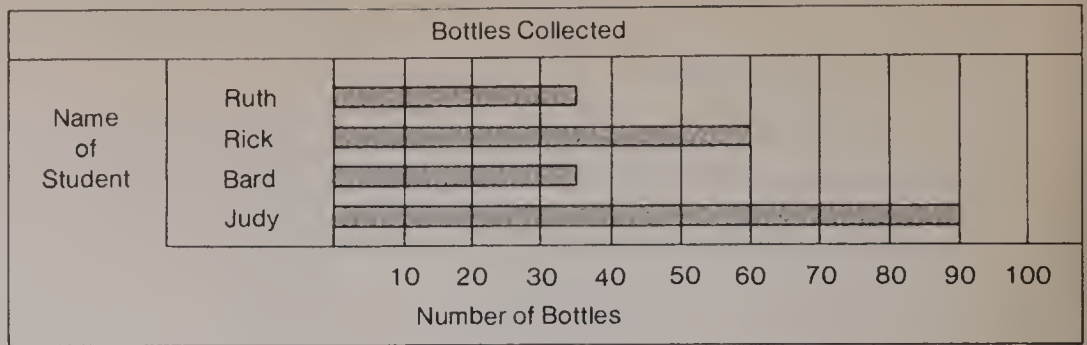
## EXTRA PRACTICE



- What is the graph about?
- During what times was the information recorded?
- How is the scale marked?
- How many cars entered the park between 10:00 and 11:00?
- During which period of time did the most cars enter the park? the least number?

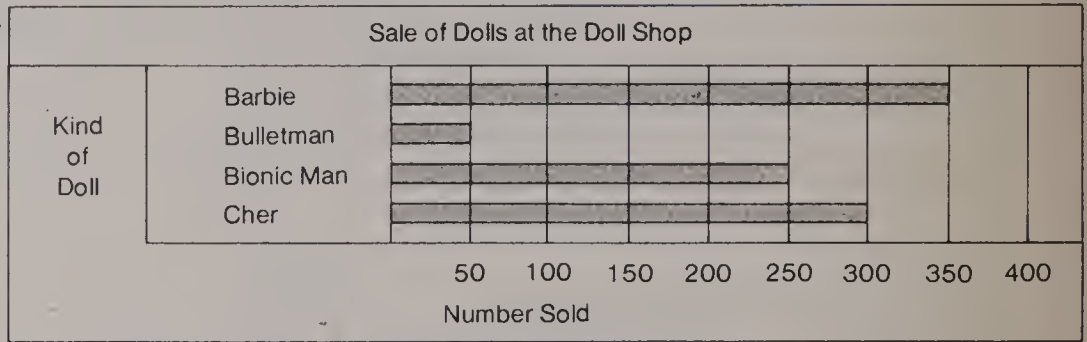
## More Bar Graphs

1.



- Who collected the same number of bottles as Ruth? **Bard**
- Who collected more bottles than Rick? **Judy**
- How many bottles were collected by Bard? **35** Ruth? **35** Rick? **60**

2.



- What is the graph about? **the number of each kind of doll sold at the Doll Shop**
- How many Bionic Man dolls were sold? **250**
- Which doll was most popular? least? **most popular: Barbie; least popular: Bulletman**
- How many dolls were sold altogether? **950**

260 Bar graphs

**Using the Book** Bar graphs may be vertical or horizontal. Ask how the number line in Exercise 1 differs from that in Exercise 2.

Ask the number of bottles that Ruth collected in Exercise 1. Ask the children how they got their answer.



# Carnival Workers



1. Popcorn is 25¢ a box.  
Mildred and Brian bought a box each.  
How much did they spend for popcorn? **50¢**
2. The cost of a ride on a ferris wheel is 35¢ for children.  
Brian bought a ticket with a \$1 bill.  
How much change did he get? **65¢**
3. The cost of a ride on the ferris wheel for adults is 75¢.  
How much for Brian's Mom and Dad? **\$1.50**

Find the cost of each lunch.

- |                           |                           |
|---------------------------|---------------------------|
| 4. Hamburger              | 5. Hot dog                |
| Coffee                    | Coffee                    |
| Pie <b>\$2.05</b>         | Pie <b>\$1.80</b>         |
| 6. Hot dog                | 7. Hot dog                |
| Pop                       | Milk                      |
| Candy apple <b>\$1.70</b> | Candy apple <b>\$1.55</b> |

| PRICES      |        |
|-------------|--------|
| Hamburger   | \$1.10 |
| Hot dog     | 0.85   |
| Pop         | 0.35   |
| Coffee      | 0.30   |
| Milk        | 0.20   |
| Candy apple | 0.50   |
| Pie         | 0.65   |

- ★ 8. Four went for a ride on the roller coaster.  
The cost was 60¢ each.  
How much change did they get from a \$5 bill? **\$2.60**
- ★ 9. Five went for a ride on the loop-the-loop.  
The cost was 75¢ each.  
How much change did they get from a \$5 bill? **\$1.25**

Word problems 261

**Using the Book** You may wish to use this page as a reading lesson for those with reading problems before assigning the problems. Other children can proceed directly with the problems.

## OBJECTIVE

To solve word problems

## PACING

Level A 1-7  
Level B All  
Level C 4-9

## RELATED AIDS

HMS—DM73.

## SUGGESTIONS

**Initial Activity** 1. Discuss the work at a carnival. See the Chapter Overview. Discuss various types of work.

2. Ask the class to relate their experiences at a carnival. Discuss the cost involved in going to the carnival.

Make up questions related to these costs.

## ACTIVITIES

1. Ask the children to draw a picture of the carnival as an art exercise.

2. Draw each of these charts for the bulletin board. Ask the children to make up questions about the charts. Suggest that the children pretend they run the popcorn stand, the candy floss stand, or the ride business. What might they have to do?

Carnival Workers

|   |
|---|
| JACK<br>THE POPCORN MAN                   |
|   |
| Small — 35¢<br>Large — 50¢<br>Giant — 75¢ |

|   |
|---|
| BUY A<br>MILLIE'S<br>CANDY FLOSS                |
|   |
| Large — 50¢<br>Giant — 75¢<br>Enormous — \$1.00 |

|   |
|---|
| RIDE WITH LUKE  |
|   |
| Loop-Da-Loop — 35¢<br>Ferris Wheel — 55¢<br>Teacup — 45¢<br>Whirlpool — 75¢ |

3. Have the children list the activities, rides, and events at a carnival. The child with the longest list can read it to the class while you list them on the chalkboard. Record using a tally system the number of children that included each event on their list. Show this information on a pictograph or bar graph. Child can be involved in collecting the data and making the graph.

OBJECTIVE

To evaluate achievement of the chapter objectives

PACING

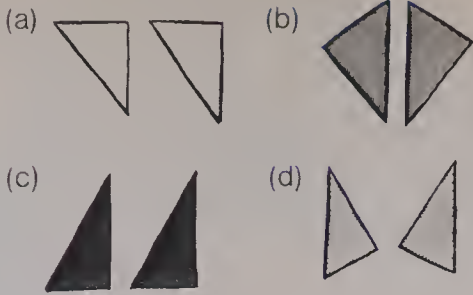
- Level A All
- Level B All
- Level C All

RELATED AIDS

HMS—DM1 and DM74.

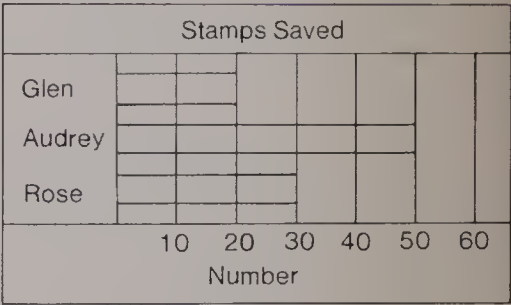
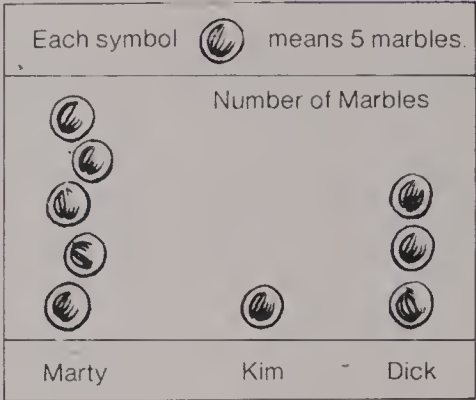
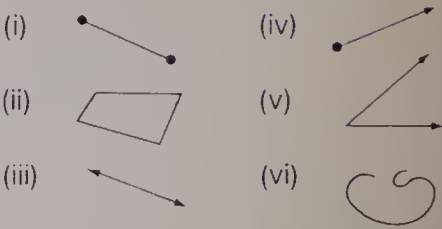
Chapter Test

1. Pick the slides. (a) and (c)



2. Match.

- (a) angle (v)
- (b) closed curve (ii)
- (c) segment (i)
- (d) open curve (vi)
- (e) ray (iv)
- (f) line (iii)



- 3. How many marbles does Marty have? 25
- 4. How would 15 marbles be shown? by 3 symbols
- 5. How many stamps did Glen save? 20
- 6. Who saved the most stamps? Audrey

**Using the Book** Each child should do this test independently under supervision. Assistance should be given only when the instructions are not understood. After the work has been corrected, you should provide appropriate remedial work. You may wish to reteach if a large number of children had difficulty with a particular topic or concept.

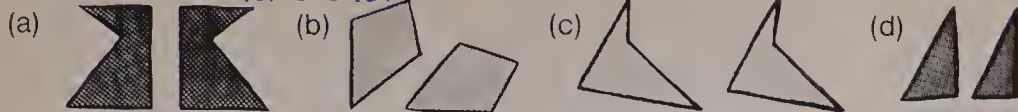
The following chart will help in this regard. The specific objectives are listed in the Chapter Overview (see page 244).

An alternate Chapter Test can be found in the Holt Mathematics System Duplicating Masters available for use with this grade level.

| Test Item | Objective | Text Page Number |
|-----------|-----------|------------------|
| 1         | B         | 250              |
| 2         | A         | 245, 246, 248    |
| 3-6       | C         | 256, 258         |

# Cumulative Review

1. Pick the slides. (c) and (d)



2. On which day did it snow the most?

Monday

3. How much did it snow on Wednesday?

4 cm

Each symbol  means 2 cm of snow.



Snowfall



Monday

Tuesday

Wednesday

Add.

4. 
$$\begin{array}{r} 51 \\ + 42 \\ \hline \end{array}$$
 5. 
$$\begin{array}{r} 33 \\ + 45 \\ \hline \end{array}$$
 6. 
$$\begin{array}{r} 476 \\ + 313 \\ \hline \end{array}$$
 7. 
$$\begin{array}{r} 645 \\ + 242 \\ \hline \end{array}$$
 8. 
$$\begin{array}{r} 400 \\ + 308 \\ \hline \end{array}$$

Subtract. 
$$\begin{array}{r} 93 \\ - 5 \\ \hline \end{array}$$
 
$$\begin{array}{r} 78 \\ - 23 \\ \hline \end{array}$$
 
$$\begin{array}{r} 789 \\ - 234 \\ \hline \end{array}$$
 
$$\begin{array}{r} 887 \\ - 354 \\ \hline \end{array}$$
 
$$\begin{array}{r} 708 \\ - 125 \\ \hline \end{array}$$

9. 
$$\begin{array}{r} 26 \\ - 5 \\ \hline \end{array}$$
 10. 
$$\begin{array}{r} 68 \\ - 23 \\ \hline \end{array}$$
 11. 
$$\begin{array}{r} 568 \\ - 234 \\ \hline \end{array}$$
 12. 
$$\begin{array}{r} 867 \\ - 354 \\ \hline \end{array}$$
 13. 
$$\begin{array}{r} 325 \\ - 125 \\ \hline \end{array}$$

Multiply. 
$$\begin{array}{r} 21 \\ \times 4 \\ \hline \end{array}$$
 
$$\begin{array}{r} 45 \\ \times 3 \\ \hline \end{array}$$
 
$$\begin{array}{r} 334 \\ \times 3 \\ \hline \end{array}$$
 
$$\begin{array}{r} 513 \\ \times 5 \\ \hline \end{array}$$
 
$$\begin{array}{r} 200 \\ \times 0 \\ \hline \end{array}$$

14. 
$$\begin{array}{r} 5 \\ \times 4 \\ \hline \end{array}$$
 15. 
$$\begin{array}{r} 2 \\ \times 3 \\ \hline \end{array}$$
 16. 
$$\begin{array}{r} 10 \\ \times 3 \\ \hline \end{array}$$
 17. 
$$\begin{array}{r} 6 \\ \times 5 \\ \hline \end{array}$$
 18. 
$$\begin{array}{r} 9 \\ \times 0 \\ \hline \end{array}$$

Divide. 
$$\begin{array}{r} 20 \\ 5 \overline{)10} \end{array}$$
 
$$\begin{array}{r} 6 \\ 3 \overline{)12} \end{array}$$
 
$$\begin{array}{r} 30 \\ 2 \overline{)60} \end{array}$$
 
$$\begin{array}{r} 3 \\ 5 \overline{)15} \end{array}$$
 
$$\begin{array}{r} 4 \\ 4 \overline{)16} \end{array}$$

19. 
$$\begin{array}{r} 2 \\ 5 \overline{)10} \end{array}$$
 20. 
$$\begin{array}{r} 4 \\ 3 \overline{)12} \end{array}$$
 21. 
$$\begin{array}{r} 3 \\ 2 \overline{)6} \end{array}$$
 22. 
$$\begin{array}{r} 3 \\ 5 \overline{)15} \end{array}$$
 23. 
$$\begin{array}{r} 4 \\ 4 \overline{)16} \end{array}$$

24. Use your ruler.

How long is the watch? 8.4 cm



25. How heavy is the block?

4 kg



Chapters 1-9: cumulative review 263

## OBJECTIVE

To review and test selected concepts and skills previously covered

**Using the Book** This page may be used for diagnostic and remedial as well as review purposes. Children should check their work, correct any errors, and review the pages that contain any problems of the type they missed. Some children can do this on their own while others may need help. If a large number of children have a particular problem incorrect, you may want to reteach that topic to the groups, then assign a duplicated worksheet to reinforce that topic or refer to an appropriate skill card in the BFA Computational Skills Kit I.

| Test Item | Text Page Number |
|-----------|------------------|
| 1         | 250              |
| 2, 3      | 254-255          |
| 4, 5      | 39               |
| 6-8       | 44               |
| 9         | 25               |
| 10        | 38               |
| 11-13     | 65-66            |
| 14, 17    | 223              |
| 15        | 161              |
| 16        | 220              |
| 18        | 171              |
| 19, 22    | 231              |
| 20        | 229              |
| 21        | 228              |
| 23        | 230              |
| 24        | 109              |
| 25        | 118              |



# CHAPTER 10 OVERVIEW

This chapter reviews and extends basic facts in multiplication and division. The art theme for this chapter is Monsters.

## OBJECTIVES

- A To multiply using facts up to  $9 \times 10$
- B To multiply numbers by 1, 10, and 100
- C To divide using facts up to  $90 \div 9$
- D To divide numbers by 10
- E To solve word problems
- F To introduce simple division with remainders

## BACKGROUND

See Chapter 6 Overview for basic concepts in multiplication and division. This chapter expands on basic facts and makes use of place value in multiplying by 1, 10, and 100. Division with remainders is handled in a very simple form with no attempt to do long division.

## MATERIALS

multiplication table  
variety of concrete materials  
array boards  
large elastic bands for “holders”  
graph paper  
cards  
centimetre cubes (for blocks)  
gummed squares, stars  
pegs  
beans  
paper plates

## CAREER AWARENESS

### Doctor [289]

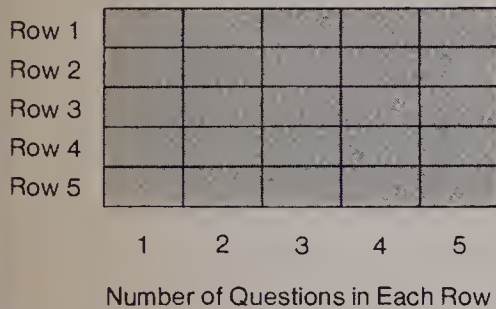
A doctor is responsible for the care of people. This involves understanding people and their needs. It takes many years of schooling to become a doctor.

A doctor must have a great deal of knowledge about diseases and different treatments, and must be sensitive to people and work very long hours.

## Tune Up

- |   |   |   |  |  |
|---|---|---|--|--|
| 1. (a) $\begin{array}{r} 4 \\ \times 6 \\ \hline 24 \end{array}$  | (b) $\begin{array}{r} 2 \\ \times 5 \\ \hline 10 \end{array}$ | (c) $\begin{array}{r} 5 \\ \times 7 \\ \hline 35 \end{array}$ | (d) $\begin{array}{r} 2 \\ \times 3 \\ \hline 6 \end{array}$   | (e) $\begin{array}{r} 3 \\ \times 4 \\ \hline 12 \end{array}$  |
| 2. (a) $\begin{array}{r} 3 \\ \times 1 \\ \hline 3 \end{array}$   | (b) $\begin{array}{r} 4 \\ \times 4 \\ \hline 16 \end{array}$ | (c) $\begin{array}{r} 5 \\ \times 3 \\ \hline 15 \end{array}$ | (d) $\begin{array}{r} 2 \\ \times 7 \\ \hline 14 \end{array}$  | (e) $\begin{array}{r} 3 \\ \times 2 \\ \hline 6 \end{array}$   |
| 3. (a) $\begin{array}{r} 4 \\ \times 10 \\ \hline 40 \end{array}$ | (b) $\begin{array}{r} 2 \\ \times 2 \\ \hline 4 \end{array}$  | (c) $\begin{array}{r} 3 \\ \times 9 \\ \hline 27 \end{array}$ | (d) $\begin{array}{r} 0 \\ \times 8 \\ \hline 0 \end{array}$   | (e) $\begin{array}{r} 0 \\ \times 10 \\ \hline 0 \end{array}$  |
| 4. (a) $\begin{array}{r} 5 \\ \times 8 \\ \hline 40 \end{array}$  | (b) $\begin{array}{r} 3 \\ \times 8 \\ \hline 24 \end{array}$ | (c) $\begin{array}{r} 4 \\ \times 2 \\ \hline 8 \end{array}$  | (d) $\begin{array}{r} 2 \\ \times 10 \\ \hline 20 \end{array}$ | (e) $\begin{array}{r} 3 \\ \times 10 \\ \hline 30 \end{array}$ |
| 5. (a) $\begin{array}{r} 3 \\ \times 3 \\ \hline 9 \end{array}$   | (b) $\begin{array}{r} 5 \\ \times 2 \\ \hline 10 \end{array}$ | (c) $\begin{array}{r} 2 \\ \times 1 \\ \hline 2 \end{array}$  | (d) $\begin{array}{r} 5 \\ \times 6 \\ \hline 30 \end{array}$  | (e) $\begin{array}{r} 0 \\ \times 9 \\ \hline 0 \end{array}$   |

Make a bar graph to show how many you have right in each row.



## BRAINTICKLER

When I multiply me by myself,  
I appear in the product as the  
last digit.

A  
 $\times A$

BA

Who am I? **5 or 6**

## OBJECTIVE

To provide practice with multiplication facts to  $5 \times 10$

## PACING

Level A 1-3

Level B All

Level C Alternate rows

**Using the Book** The children should work independently on these questions. If any children have unusual difficulty with this page, you may want to set up remedial work based on the type of facts found on this page.

For review of work on bar graphs see the previous chapter before assigning the graph work at the bottom of the page.

## OBJECTIVE

To teach multiplying by 6 up to  $6 \times 10$

## PACING

Level A All

Level B All

Level C All

## MATERIALS

counters, large elastic bands

## RELATED AIDS

BFA COMP LAB I—92.

## SUGGESTIONS

**Initial Activity** Use elastic bands as “holders” for the counters. Have the children discover and record the various multiplication stories using six counters in each “holder”. Be sure to illustrate the commutative property with the counters before going to the pupil text.

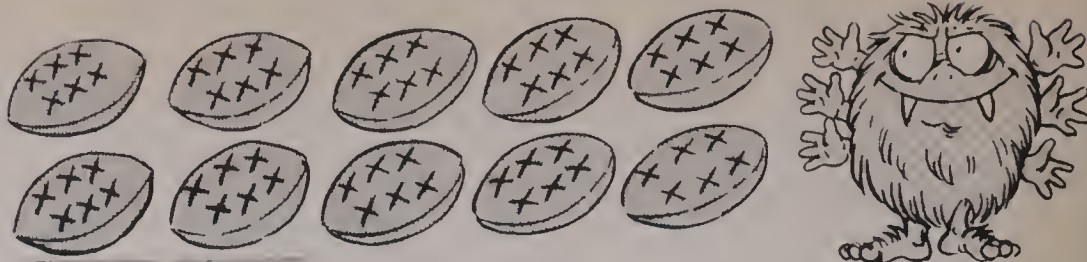
## ACTIVITIES

1. Have the children work in pairs. Have one child set up a multiplication story for 6 (similar to those mentioned above) and have the other child record the story. The roles would then be reversed.

2. Use the “Missing Numbers” game from the Activity Reservoir.

3. Use “The Facts Machine” game from the Activity Reservoir.

## Monster Multiplication (By 6)



4 groups of 6

$4 \times 6 = 24$

Since:  $6 \times 2 = 12$  Then:

$6 \times 3 = 18$

$6 \times 4 = 24$

$6 \times 5 = 30$

$2 \times 6 = \blacksquare 12$

$3 \times 6 = \blacksquare 18$

$4 \times 6 = \blacksquare 24$

$5 \times 6 = \blacksquare 30$

Multiply.

1.  $5 \times 6 = \blacksquare 30$

2.  $2 \times 6 = \blacksquare 12$

3.  $1 \times 6 = \blacksquare 6$

4.  $10 \times 6 = \blacksquare 60$

5.  $4 \times 6 = \blacksquare 24$

6.  $6 \times 6 = \blacksquare 36$

7.  $3 \times 6 = \blacksquare 18$

8.  $0 \times 6 = \blacksquare 0$

9.  $7 \times 6 = \blacksquare 42$

|  |  |  |  |  |   |
|--|--|--|--|--|---|
| 10.<br>$\begin{array}{r} 6 \\ \times 6 \\ \hline 36 \end{array}$ | 11.<br>$\begin{array}{r} 6 \\ \times 4 \\ \hline 24 \end{array}$ | 12.<br>$\begin{array}{r} 6 \\ \times 8 \\ \hline 48 \end{array}$ | 13.<br>$\begin{array}{r} 6 \\ \times 2 \\ \hline 12 \end{array}$ | 14.<br>$\begin{array}{r} 6 \\ \times 0 \\ \hline 0 \end{array}$  | 15.<br>$\begin{array}{r} 6 \\ \times 10 \\ \hline 60 \end{array}$ |
| 16.<br>$\begin{array}{r} 6 \\ \times 1 \\ \hline 6 \end{array}$  | 17.<br>$\begin{array}{r} 6 \\ \times 7 \\ \hline 42 \end{array}$ | 18.<br>$\begin{array}{r} 6 \\ \times 3 \\ \hline 18 \end{array}$ | 19.<br>$\begin{array}{r} 6 \\ \times 9 \\ \hline 54 \end{array}$ | 20.<br>$\begin{array}{r} 6 \\ \times 7 \\ \hline 42 \end{array}$ | 21.<br>$\begin{array}{r} 6 \\ \times 5 \\ \hline 30 \end{array}$  |
| 22.<br>$\begin{array}{r} 4 \\ \times 3 \\ \hline 12 \end{array}$ | 23.<br>$\begin{array}{r} 5 \\ \times 5 \\ \hline 25 \end{array}$ | 24.<br>$\begin{array}{r} 3 \\ \times 6 \\ \hline 18 \end{array}$ | 25.<br>$\begin{array}{r} 0 \\ \times 4 \\ \hline 0 \end{array}$  | 26.<br>$\begin{array}{r} 1 \\ \times 3 \\ \hline 3 \end{array}$  | 27.<br>$\begin{array}{r} 4 \\ \times 4 \\ \hline 16 \end{array}$  |

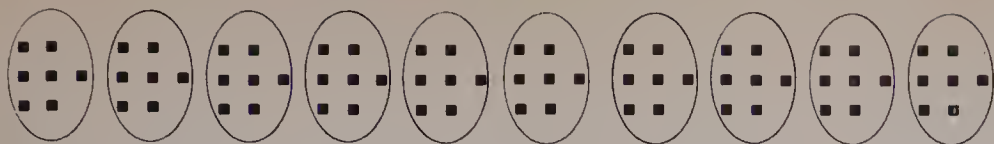
266 Multiplying by 6 up to  $6 \times 10$

**Using the Book** Draw the children's attention to the artwork at the top of the page. Focus attention directly on the first four groups. Ask, “How many  $\times$ 's in 1 group? (6)” “How many groups? (4)” “How many in all? (24)” “What multiplication story can we write for this? ( $4 \times 6 = 24$ )” “What related multiplication story can we write? ( $6 \times 4 = 24$ )” Tell children “We can say: Since  $4 \times 6 = 24$  then  $6 \times 4 = 24$ .” Look at other “since and then” stories. Do this orally with group.

Assign the page and have the children multiply to find the answers. Exercises 1, 2, and 3 can be verified in the back of the book.



# Monster Multiplication (By 7)



4 groups of 7  $\rightarrow 4 \times 7 = 28$

Since:  $7 \times 2 = 14$  Then:  $2 \times 7 = \blacksquare 14$   
 $7 \times 3 = 21$   $3 \times 7 = \blacksquare 21$   
 $7 \times 4 = 28$   $4 \times 7 = \blacksquare 28$   
 $7 \times 5 = 35$   $5 \times 7 = \blacksquare 35$



Multiply.

- |                                    |                                   |                                   |
|------------------------------------|-----------------------------------|-----------------------------------|
| 1. $10 \times 7 = \blacksquare 70$ | 2. $6 \times 7 = \blacksquare 42$ | 3. $2 \times 7 = \blacksquare 14$ |
| 4. $1 \times 7 = \blacksquare 7$   | 5. $9 \times 7 = \blacksquare 63$ | 6. $5 \times 7 = \blacksquare 35$ |
| 7. $4 \times 7 = \blacksquare 28$  | 8. $0 \times 7 = \blacksquare 0$  | 9. $3 \times 7 = \blacksquare 21$ |
- 
- |   |  |   |   |   |   |
|---|--|---|---|---|---|
| 10. $\begin{array}{r} 7 \\ \times 1 \\ \hline 7 \end{array}$  | 11. $\begin{array}{r} 7 \\ \times 6 \\ \hline 42 \end{array}$  | 12. $\begin{array}{r} 7 \\ \times 0 \\ \hline 0 \end{array}$  | 13. $\begin{array}{r} 7 \\ \times 3 \\ \hline 21 \end{array}$ | 14. $\begin{array}{r} 7 \\ \times 9 \\ \hline 63 \end{array}$ | 15. $\begin{array}{r} 7 \\ \times 5 \\ \hline 35 \end{array}$ |
| 16. $\begin{array}{r} 7 \\ \times 2 \\ \hline 14 \end{array}$ | 17. $\begin{array}{r} 7 \\ \times 10 \\ \hline 70 \end{array}$ | 18. $\begin{array}{r} 7 \\ \times 8 \\ \hline 56 \end{array}$ | 19. $\begin{array}{r} 7 \\ \times 7 \\ \hline 49 \end{array}$ | 20. $\begin{array}{r} 7 \\ \times 4 \\ \hline 28 \end{array}$ | 21. $\begin{array}{r} 7 \\ \times 6 \\ \hline 42 \end{array}$ |
| 22. $\begin{array}{r} 5 \\ \times 5 \\ \hline 25 \end{array}$ | 23. $\begin{array}{r} 3 \\ \times 1 \\ \hline 3 \end{array}$   | 24. $\begin{array}{r} 2 \\ \times 0 \\ \hline 0 \end{array}$  | 25. $\begin{array}{r} 3 \\ \times 3 \\ \hline 9 \end{array}$  | 26. $\begin{array}{r} 6 \\ \times 6 \\ \hline 36 \end{array}$ | 27. $\begin{array}{r} 4 \\ \times 3 \\ \hline 12 \end{array}$ |

Multiplying by 7 up to  $7 \times 10$  267

**Using the Book** Make children aware of the artwork at the top of the page. Focus attention on the first four groups. Ask, "How many squares in 1 group? (7)" "How many groups in the bracket? (4)" "How many squares in all? (28)" "What multiplication story can we write for this? ( $4 \times 7 = 28$ )" "What related multiplication story can we write? ( $7 \times 4 = 28$ )" Say, "Since  $4 \times 7 = 28$  then  $7 \times 4 = 28$ ." Look at other "since and then" stories. Do this orally with group.

Assign the page. Have the children copy and complete the multiplication stories in their workbooks.

## OBJECTIVE

To teach multiplying by 7 up to  $7 \times 10$

## PACING

Level A All  
 Level B All  
 Level C All

## MATERIALS

counters, elastics

## RELATED AIDS

BFA COMP LAB I—93.

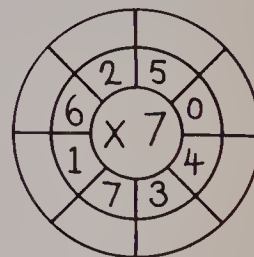
## SUGGESTIONS

**Initial Activity** Set up situations similar to those already mentioned on page 266. Have the children record the multiplication stories for 7.

## ACTIVITIES

1. Have a set of cards showing sets of 7 (similar to those at the top of this page). The children choose a card and write the corresponding multiplication story for 7.

2. Prepare fact wheels such as:



3. Prepare a card for matching.

$2 \times 7 = \blacksquare$   $7 \times 5 = \blacksquare$   
 $7 \times 3 = \blacksquare$   $7 \times 2 = \blacksquare$   
 $5 \times 7 = \blacksquare$   $3 \times 7 = \blacksquare$   
 etc.


## OBJECTIVE

To provide practice in multiplication using arrays

## PACING

Level A All  
Level B All  
Level C Optional

## ACTIVITIES

1. Give the children more multiplication stories on cards. Have them draw arrays to go with each.
2. List the numbers 0 to 7 on puddles . Child steps on two

puddles at one time and gives the product of the two numbers.

*Example*



Child says 14. If the answer is correct, the child does not get wet. If the answer is incorrect, the child falls in and gets wet.

3. Have children write and illustrate mini-problems using multiplication facts of 6 and 7.

## Practice: Arrays

□ □ □ □ □ □

This is an **array**.

□ □ □ □ □ □

□ □ □ □ □ □

Here are two multiplication stories you can write about it.

(a)

□ □ □ □ □ □

□ □ □ □ □ □ or

□ □ □ □ □ □

$$3 \times 6 = 18 \square\text{'s.}$$

(b)

□ □ □ □ □ □

□ □ □ □ □ □

□ □ □ □ □ □

$$6 \times 3 = 18 \square\text{'s.}$$

Make two multiplication stories to go with each of these arrays.

1.

□ □ □ □ □ □ □ □  
□ □ □ □ □ □ □ □  
□ □ □ □ □ □ □ □  
□ □ □ □ □ □ □ □  
□ □ □ □ □ □ □ □  
□ □ □ □ □ □ □ □

2.

○ ○ ○ ○ ○ ○  
○ ○ ○ ○ ○ ○  
○ ○ ○ ○ ○ ○  
○ ○ ○ ○ ○ ○  
○ ○ ○ ○ ○ ○  
○ ○ ○ ○ ○ ○  
○ ○ ○ ○ ○ ○

$$6 \times 9 = 54$$

or

$$9 \times 6 = 54$$

$$7 \times 6 = 42$$

or

$$6 \times 7 = 42$$

3.

■ ■ ■ ■ ■ ■ ■ ■  
■ ■ ■ ■ ■ ■ ■ ■  
■ ■ ■ ■ ■ ■ ■ ■  
■ ■ ■ ■ ■ ■ ■ ■  
■ ■ ■ ■ ■ ■ ■ ■  
■ ■ ■ ■ ■ ■ ■ ■

4.

● ● ● ● ● ● ● ●  
● ● ● ● ● ● ● ●  
● ● ● ● ● ● ● ●  
● ● ● ● ● ● ● ●  
● ● ● ● ● ● ● ●  
● ● ● ● ● ● ● ●  
● ● ● ● ● ● ● ●

$$7 \times 8 = 56$$

or

$$8 \times 7 = 56$$

$$6 \times 8 = 48$$

or

$$8 \times 6 = 48$$

Draw arrays to go with each.

5.  $6 \times 6$

6.  $9 \times 7$

7.  $4 \times 7$

8.  $5 \times 6$

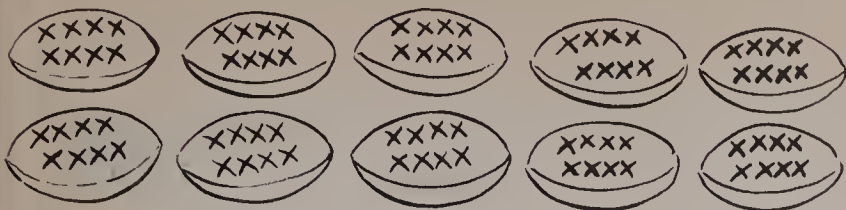
268 Practice: arrays

**Using the Book** Draw attention to the array at the top of the page. Discuss two ways in which to work with the array. (a) Ask, "How many groups? (3)" "How many squares in each group? (6)" "How many □'s altogether? (18)" "What multiplication fact goes with this? ( $3 \times 6 = 18$ )" (b) Ask, "How many groups? (6)" "How many squares in each group? (3)" "How many squares in all? (18)" "What multiplication fact goes with this? ( $6 \times 3 = 18$ )" The children should work independently on these questions. If any children have unusual difficulty with this page, you may want to set up remedial work based on the type of facts found on this page.

Some children may wish to use geo-boards and elastics to demonstrate different arrays in a concrete manner.

Previous work on "Array Books" from Chapters 6 and 8 should be continued using graph-paper arrays.

# Monster Multiplication (By 8)



2 groups of 8

$$2 \times 8 = 16$$

Since:  $8 \times 2 = 16$   
 $8 \times 3 = 24$   
 $8 \times 4 = 32$   
 $8 \times 5 = 40$

Then:  $2 \times 8 = \blacksquare 16$   
 $3 \times 8 = \blacksquare 24$   
 $4 \times 8 = \blacksquare 32$   
 $5 \times 8 = \blacksquare 40$

Multiply.

- |                                    |                                   |                                   |
|------------------------------------|-----------------------------------|-----------------------------------|
| 1. $10 \times 8 = \blacksquare 80$ | 2. $6 \times 8 = \blacksquare 48$ | 3. $9 \times 8 = \blacksquare 72$ |
| 4. $0 \times 8 = \blacksquare 0$   | 5. $1 \times 8 = \blacksquare 8$  | 6. $7 \times 8 = \blacksquare 56$ |
| 7. $3 \times 8 = \blacksquare 24$  | 8. $2 \times 8 = \blacksquare 16$ | 9. $5 \times 8 = \blacksquare 40$ |
- 
- |  |   |   |   |   |   |
|--|---|---|---|---|---|
| 10. $\begin{array}{r} 8 \\ \times 2 \\ \hline 16 \end{array}$  | 11. $\begin{array}{r} 8 \\ \times 5 \\ \hline 40 \end{array}$ | 12. $\begin{array}{r} 8 \\ \times 0 \\ \hline 0 \end{array}$  | 13. $\begin{array}{r} 8 \\ \times 3 \\ \hline 24 \end{array}$ | 14. $\begin{array}{r} 8 \\ \times 7 \\ \hline 56 \end{array}$ | 15. $\begin{array}{r} 8 \\ \times 4 \\ \hline 32 \end{array}$ |
| 16. $\begin{array}{r} 8 \\ \times 10 \\ \hline 80 \end{array}$ | 17. $\begin{array}{r} 8 \\ \times 1 \\ \hline 8 \end{array}$  | 18. $\begin{array}{r} 8 \\ \times 6 \\ \hline 48 \end{array}$ | 19. $\begin{array}{r} 8 \\ \times 8 \\ \hline 64 \end{array}$ | 20. $\begin{array}{r} 8 \\ \times 3 \\ \hline 24 \end{array}$ | 21. $\begin{array}{r} 8 \\ \times 9 \\ \hline 72 \end{array}$ |
| 22. $\begin{array}{r} 1 \\ \times 1 \\ \hline 1 \end{array}$   | 23. $\begin{array}{r} 2 \\ \times 2 \\ \hline 4 \end{array}$  | 24. $\begin{array}{r} 6 \\ \times 0 \\ \hline 0 \end{array}$  | 25. $\begin{array}{r} 7 \\ \times 1 \\ \hline 7 \end{array}$  | 26. $\begin{array}{r} 4 \\ \times 2 \\ \hline 8 \end{array}$  | 27. $\begin{array}{r} 3 \\ \times 5 \\ \hline 15 \end{array}$ |

Multiplying by 8 up to  $8 \times 10$  269

**Using the Book** Have the children observe the artwork at the top of the page and focus attention on the first two groups. Ask, "How many X's in each group? (8)" "How many groups? (2)" "How many X's in all? (16)" "What multiplication fact can we write for this? ( $2 \times 8 = 16$ )" "What related multiplication fact can we use? ( $8 \times 2 = 16$ )" Say, "Since  $2 \times 8 = 16$  then  $8 \times 2 = 16$ ." Do orally other "since and then" problems on the page.

Have the children copy and complete the work by multiplying. Exercises 1, 2, and 3 can be verified in the back of the book.

## OBJECTIVE

To teach multiplying by 8 up to  $8 \times 10$

## PACING

Level A All  
 Level B All  
 Level C All

## MATERIALS

counters, elastics

## RELATED AIDS

BFA COMP LAB I—94.

## SUGGESTIONS

**Initial Activity** Have the children use counters and elastics as suggested for multiplying by 6 and 7. Do several examples and have the children record the multiplication stories.

## ACTIVITIES

1. Have the children use graph paper to make arrays for multiplying by 8 and record the correct multiplication story under each array.

2. This is a good gym activity. The children sit on the floor and form a circle. The child who has possession of a rubber ball starts by saying  $0 \times 8 = 0$ . The child then rolls the ball to another member of the group who should say  $1 \times 8 = 8$ . The second child in turn rolls to someone else and so on. If a child cannot give an answer, the child rolls the ball to someone else without penalty.

3. Prepare a large activity card such as:

Multiply the number of letters in your first name by 2, and subtract the number of letters in your last name (if possible) from the product.

$$\begin{array}{r} \text{JILL} \longrightarrow 4 \\ \times 2 \\ \hline 8 \end{array}$$

$$\begin{array}{r} \text{JONES} \longrightarrow 5 \\ 8 - 5 = 3 \end{array}$$



## OBJECTIVE

To teach multiplying by 9 up to  
 $9 \times 10$

## PACING

Level A All  
Level B All  
Level C All

## MATERIALS

counters, elastics

## RELATED AIDS

BFA COMP LAB I—95.  
HMS—DM75.

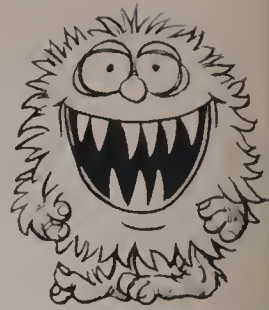
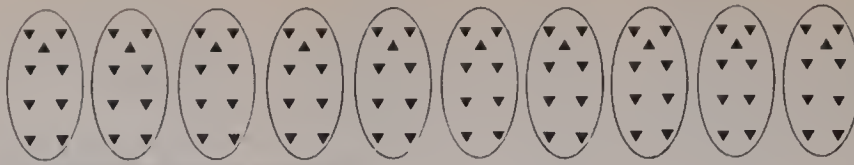
## SUGGESTIONS

**Initial Activity** Set up situations similar to those already mentioned on page 269. Have the children record the multiplication stories for 9.

## ACTIVITIES

1. Continue array activities using graph paper. (See page 269.)
2. Use the game "Shuffle Numbers" in the Activity Reservoir. Modify to match the skills in this section.
3. Keep a chart about the weather for a week. Record if it was sunny, cloudy, rainy, snowy; and mark temperatures for a week. Share with a friend.

## Monster Multiplication (By 9)



4 groups of 9

$$4 \times 9 = 36$$

Since:  $9 \times 2 = 18$

Then:

$$2 \times 9 = \blacksquare 18$$

$$9 \times 3 = 27$$

$$3 \times 9 = \blacksquare 27$$

$$9 \times 4 = 36$$

$$4 \times 9 = \blacksquare 36$$

$$9 \times 5 = 45$$

$$5 \times 9 = \blacksquare 45$$

Multiply.

1.  $10 \times 9 = \blacksquare 90$

2.  $8 \times 9 = \blacksquare 72$

3.  $6 \times 9 = \blacksquare 54$

4.  $1 \times 9 = \blacksquare 9$

5.  $2 \times 9 = \blacksquare 18$

6.  $0 \times 9 = \blacksquare 0$

7.  $5 \times 9 = \blacksquare 45$

8.  $7 \times 9 = \blacksquare 63$

9.  $9 \times 9 = \blacksquare 81$

|  |  |  |  |   |  |
|--|--|--|--|---|--|
| 10.<br>$\begin{array}{r} 9 \\ \times 7 \\ \hline 63 \end{array}$ | 11.<br>$\begin{array}{r} 9 \\ \times 3 \\ \hline 27 \end{array}$ | 12.<br>$\begin{array}{r} 9 \\ \times 6 \\ \hline 54 \end{array}$ | 13.<br>$\begin{array}{r} 9 \\ \times 0 \\ \hline 0 \end{array}$  | 14.<br>$\begin{array}{r} 9 \\ \times 5 \\ \hline 45 \end{array}$  | 15.<br>$\begin{array}{r} 9 \\ \times 9 \\ \hline 81 \end{array}$ |
| 16.<br>$\begin{array}{r} 9 \\ \times 8 \\ \hline 72 \end{array}$ | 17.<br>$\begin{array}{r} 9 \\ \times 1 \\ \hline 9 \end{array}$  | 18.<br>$\begin{array}{r} 9 \\ \times 6 \\ \hline 54 \end{array}$ | 19.<br>$\begin{array}{r} 9 \\ \times 2 \\ \hline 18 \end{array}$ | 20.<br>$\begin{array}{r} 9 \\ \times 10 \\ \hline 90 \end{array}$ | 21.<br>$\begin{array}{r} 9 \\ \times 4 \\ \hline 36 \end{array}$ |
| 22.<br>$\begin{array}{r} 6 \\ \times 6 \\ \hline 36 \end{array}$ | 23.<br>$\begin{array}{r} 3 \\ \times 7 \\ \hline 21 \end{array}$ | 24.<br>$\begin{array}{r} 2 \\ \times 1 \\ \hline 2 \end{array}$  | 25.<br>$\begin{array}{r} 0 \\ \times 6 \\ \hline 0 \end{array}$  | 26.<br>$\begin{array}{r} 5 \\ \times 3 \\ \hline 15 \end{array}$  | 27.<br>$\begin{array}{r} 4 \\ \times 2 \\ \hline 8 \end{array}$  |

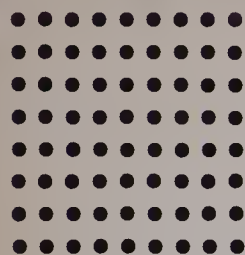
270 Multiplying by 9 up to  $9 \times 10$

**Using the Book** Have the children observe the artwork at the top of the page. Discuss the first four groups with the children. Ask, "How many  $\blacktriangle$ 's in a group? (9)" "How many groups? (4)" "How many  $\blacktriangle$ 's in all? (36)" "What multiplication story accompanies this? ( $4 \times 9 = 36$ )" "What related multiplication story can we write? ( $9 \times 4 = 36$ )" Say, "Since  $4 \times 9 = 36$  then  $9 \times 4 = 36$ ." Do orally other "since and then" questions.

Assign the work and have the children copy and multiply to complete the work. Exercises 1, 2, and 3 may be verified in the back of the book.

# Practice: Arrays

Make two multiplication stories to go with each of these arrays.

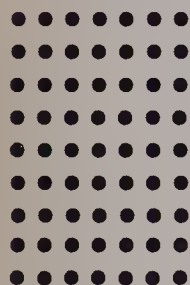


$$\begin{array}{l} 8 \times 9 = 72 \\ \text{or} \\ 9 \times 8 = 72 \end{array}$$



$$\begin{array}{l} 8 \times 6 = 48 \\ \text{or} \\ 6 \times 8 = 48 \end{array}$$

3.



$$\begin{array}{l} 9 \times 7 = 63 \\ \text{or} \\ 7 \times 9 = 63 \end{array}$$

4.



$$\begin{array}{l} 9 \times 5 = 45 \\ \text{or} \\ 5 \times 9 = 45 \end{array}$$

Draw arrays to go with each.

5.  $6 \times 8$       6.  $7 \times 8$       7.  $7 \times 7$       8.  $8 \times 7$

Now do these. Copy and complete.

9.  $5 \times 6 = \blacksquare 30$    10.  $7 \times 6 = \blacksquare 42$    11.  $7 \times 9 = \blacksquare 63$    12.  $8 \times 9 = \blacksquare 72$   
13.  $9 \times 7 = \blacksquare 63$    14.  $9 \times 8 = \blacksquare 72$    15.  $9 \times 5 = \blacksquare 45$    16.  $6 \times 9 = \blacksquare 54$   
17.  $6 \times 6 = \blacksquare 36$    18.  $8 \times 8 = \blacksquare 64$    19.  $9 \times 9 = \blacksquare 81$    20.  $9 \times 6 = \blacksquare 54$

Practice: arrays 271

## OBJECTIVE

To provide practice in multiplication using arrays

## PACING

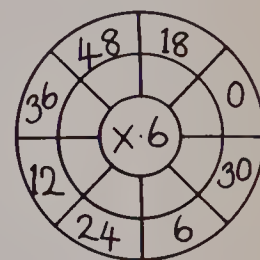
Level A All  
Level B All  
Level C 5-20

## ACTIVITIES

1. Have the children use geo-boards and elastics to demonstrate different arrays in a concrete manner.

2. Use "The Multiplication Game" in the Activity Reservoir. Modify to match the skills in this section.

3. Prepare a card such as:



4. Use graph paper and "Array Books".

**Using the Book** The children should work independently on these questions. If any children have unusual difficulty with this page, you may want to set up remedial work based on the type of facts found on this page.

## OBJECTIVE

To teach and reinforce dividing by 6

## PACING

Level A All

Level B All

Level C All

## MATERIALS

graph paper, cards

## RELATED AIDS

BFA COMP LAB I—115.

## SUGGESTIONS

**Initial Activity** Emphasize that knowing the multiplication facts in multiplying by 6 can help the children with dividing by 6.

Set up situations where the children can demonstrate these basic facts using graph paper.

## ACTIVITIES

1. Make up two sets of cards — one with the division story written using  $\div$  and one using the division sign  $\overline{)}$ . Have the children match the two.

*Example*

$$24 \div 6 = 4$$

$$\begin{array}{r} 4 \\ 6 \overline{)24} \end{array}$$

2. Have the children make up their own problems. They share with a person who has the same number of letters in the first name.

3. Play Bingo by distributing a  $5 \times 5$  blank grid which children fill in individually with numbers of 30 or less. Display cards such as  $18 \div 6$  or  $6 \overline{)18}$ . If children have that quotient on their card, they cross it off. Regular Bingo rules apply. Be sure children have (a) all spaces filled on their grids, (b) no number over 30, (c) no number used twice. You may wish to display cards such as  $6 \times 3$  and  $5 \times 6$  to keep multiplication facts sharp.



## Monster Picnic



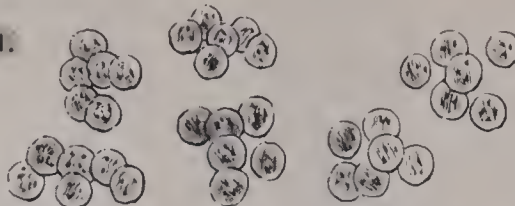
12 ice-cream cones.

6 ice-cream cones for each monster.

How many monsters?

$$12 \div 6 = 2 \quad \text{or} \quad \begin{array}{r} 2 \\ 6 \overline{)12} \end{array}$$

1.



36 cookies.

6 in each group.

How many groups? 6

$$6 \overline{)36}$$

2.



42 spots on the ants.

6 spots on each.

How many ants? 7

$$6 \overline{)42}$$

3.



48 pop bottles.

6 in each case.

How many cases? 8

$$6 \overline{)48}$$

4.



60 petals on the flowers.

6 petals on each.

How many flowers? 10

$$6 \overline{)60}$$

272 Dividing by 6

**Using the Book** Draw attention to the artwork at the top of the page. Ask, "How many cones are there altogether? (12)" "How many cones are in each group (for each monster)? (6)" "How many groups (monsters)? (2)" "In what

two ways can we write this division story  $(12 \div 6 = 2 \text{ or } 6 \overline{)12})$ " Reinforce the use of the division sign  $\overline{)}$  as a new way of writing a division story.

*Example*

$$8 \div 4 = 2 \text{ or } 4 \overline{)8}$$

Have the children complete the work in their notebooks. Exercise 1 may be verified in the back of the book.



# Monster Division (By 7)



21 candies.

7 candies for each monster.

How many monsters?

$$21 \div 7 = 3$$

or

$$\begin{array}{r} 3 \\ 7 \overline{)21} \end{array}$$

1.



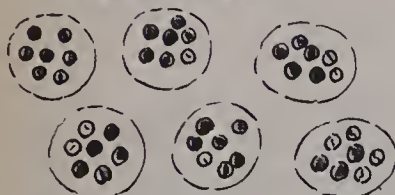
35 buttons.

7 for each coat.

How many coats? **5**

$$\begin{array}{r} 5 \\ 7 \overline{)35} \end{array}$$

2.



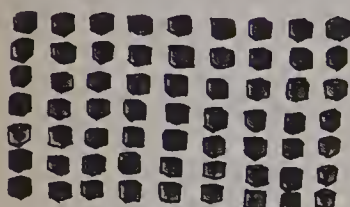
42 marbles.

7 in each ring.

How many rings? **6**

$$\begin{array}{r} 6 \\ 7 \overline{)42} \end{array}$$

3.



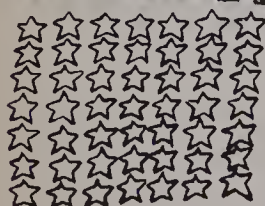
63 blocks.

7 in each column.

How many columns? **9**

$$\begin{array}{r} 9 \\ 7 \overline{)63} \end{array}$$

4.



49 stars.

7 in each group.

How many groups? **7**

$$\begin{array}{r} 7 \\ 7 \overline{)49} \end{array}$$

Dividing by 7 **273**

**Using the Book** Look at the artwork at the top of the page. Ask, "How many candies in all? (21)" "How many for each monster (in each group)? (7)" "How many monsters (groups)? (3)" "What two ways can this division story be

written?  $\left( \begin{array}{r} 3 \\ 7 \overline{)21} \end{array} \text{ or } 21 \div 7 = 3 \right)$ "

Have the children use the arrays to help solve the questions, then copy the answers into their workbooks.

## OBJECTIVE

To teach and reinforce dividing by 7

## PACING

Level A All

Level B All

Level C All

## MATERIALS

graph paper, cards

## RELATED AIDS

BFA COMP LAB I—116.

## SUGGESTIONS

**Initial Activity** Continue the same type of situations as suggested on page 272.

## ACTIVITIES

1. Have the children draw arrays, then have a partner write a problem to accompany the array and find a third person to answer the question.

2. Prepare cards with two numbers on each card. Child uses as many signs as possible with the numbers.

*Example*

$\boxed{6, 2}$

$$6 \times 2 = 12$$

$$6 - 2 = 4$$

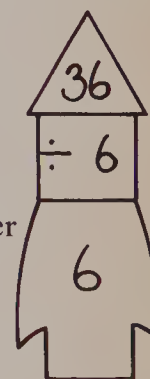
$$6 \div 2 = 3$$

$$6 + 2 = 8$$

3. Prepare cards for a division drill.



answer



etc.

## OBJECTIVE

To provide practice in division

## PACING

Level A All  
Level B All  
Level C 1-23 odd numbered  
25-30

## Practice

Copy and complete.

Divide by 6.

1.  $6 \overline{)24}$  4

2.  $6 \overline{)18}$  3

3.  $6 \overline{)54}$  9

4.  $6 \overline{)60}$  10

5.  $6 \overline{)48}$  8

6.  $6 \overline{)36}$  6

7.  $6 \overline{)12}$  2

8.  $6 \overline{)30}$  5

9.  $6 \overline{)42}$  7

10.  $6 \overline{)6}$  1

11.  $6 \overline{)48}$  8

12.  $6 \overline{)36}$  6

Divide by 7.

13.  $7 \overline{)56}$  8

14.  $7 \overline{)63}$  9

15.  $7 \overline{)21}$  3

16.  $7 \overline{)14}$  2

17.  $7 \overline{)28}$  4

18.  $7 \overline{)49}$  7

19.  $7 \overline{)35}$  5

20.  $7 \overline{)7}$  1

21.  $7 \overline{)56}$  8

22.  $7 \overline{)70}$  10

23.  $7 \overline{)49}$  7

24.  $7 \overline{)42}$  6

25. 24 legs on monsters.  
6 legs on each.  
How many monsters? 4

26. 21 spots on monsters.  
7 spots on each.  
How many monsters? 3

27. 36 cars in rows.  
6 cars in each row.  
How many rows? 6

28. 49 lions in prides.  
7 lions in each pride.  
How many prides? 7

29. 56 tables in classrooms.  
7 tables in each.  
How many classrooms? 8

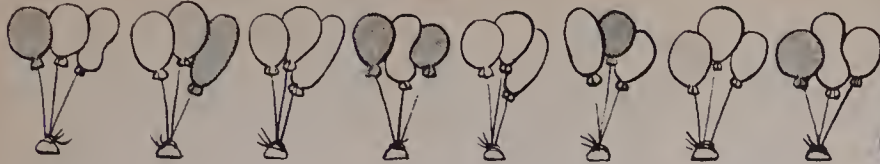
30. 48 roses in pots.  
6 roses in each.  
How many pots? 8

274 Practice

**Using the Book** For Exercises 1-24, have the children copy the questions into their workbooks and complete using the method they have been shown. The children should work independently on these questions. If any children have unusual difficulty with this page, you may want to set up remedial work based on the type of facts on this page.

Exercises 25-30 are short word problems involving division. Be sure children are familiar with an acceptable response format.

# Monster Division (By 8)



24 balloons.

8 monsters want to share.

How many balloons for each monster?

$$24 \div 8 = 3 \quad \text{or} \quad 8 \overline{)24}^3$$

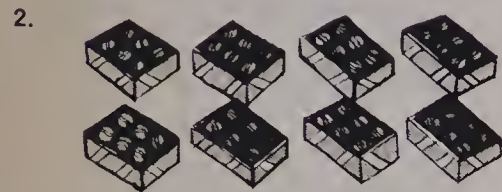


64 marbles.

8 monsters.

How many marbles each? **8**

$$8 \overline{)64}$$

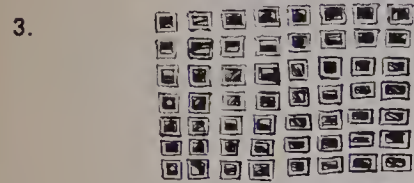


48 chocolates.

8 monsters.

How many each? **6**

$$8 \overline{)48}$$

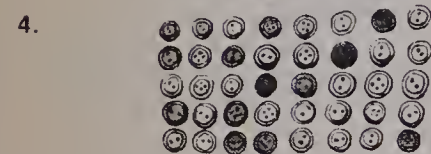


56 stamps.

8 columns.

How many in each column? **7**

$$8 \overline{)56}$$



40 buttons.

8 coats.

How many on each coat? **5**

$$8 \overline{)40}$$

Dividing by 8 275

**Using the Book** Discuss the artwork at the top of the page. Ask, "How many balloons are there in all? (24)" "How many groups (monsters want to share)? (8)" "How many in each group (balloons/monsters)? (3)" "In what two ways can

we write this division story?  $\left(8 \overline{)24}^3 \text{ or } 24 \div 8 = 3\right)$ "

Have the children use arrays to help solve the problems and complete the answers. Have concrete materials available for those children who need to use them when recording the division stories.

*Note:* If they can come up with more than four related stories, they can take someone else's monster.

*Example*

$$6 \times 4 = 24$$

$$4 \times 6 = 24$$

$$24 \div 6 = 4$$

$$24 \div 4 = 6$$

## OBJECTIVE

To teach and reinforce dividing by 8

## PACING

Level A All

Level B All

Level C All

## MATERIALS

counters, elastic bands, graph paper

## RELATED AIDS

BFA COMP LAB I—117.

## SUGGESTIONS

**Initial Activity** Use counters and elastic bands to demonstrate the example at the top of this page.

Do several additional examples using 32, 48, and 56 counters.

## ACTIVITIES

1. Have the children use graph paper to isolate an array and then write the corresponding multiplication and division stories for 8.

*Example*

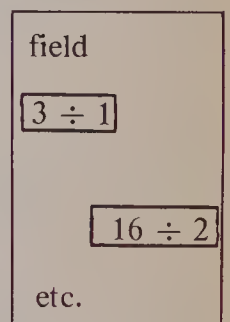
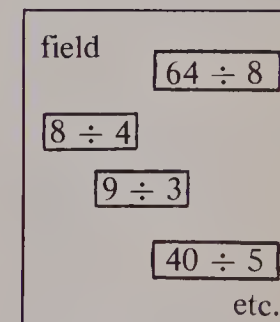


$$6 \times 8 = 48$$

$$8 \times 6 = 48$$

$$8 \overline{)48}^6$$

2. Set up the following game.



w  
a  
t  
e  
r

Have the children select a card from one of the fields. Then a child selects a card from the other field that would have the same quotient. If cards match (answer on back), the child has crossed on the bridge and is safe. If the answers do not match, the child has waded through, got wet, must go home to change, and can't have another turn.

3. See Problem of the Week #30.

4. *Monster Hunt* Assign number values to each "Monster", e.g., 24. The children must come up with four related stories (multiplication and division) in order to "capture" a monster.

*Example*

$$3 \times 8 = 24$$

$$8 \times 3 = 24$$

$$24 \div 3 = 8$$

$$24 \div 8 = 3$$



**OBJECTIVE**  
To teach and reinforce dividing by 9

**PACING**  
Level A All  
Level B All  
Level C All

**MATERIALS**  
counters, elastic bands, graph paper

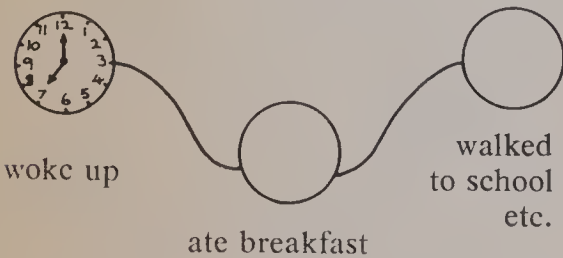
**RELATED AIDS**  
BFA COMP LAB I—118.  
HMS—DM76.

**SUGGESTIONS**  
**Initial Activity** Use counters and elastic bands to demonstrate the example at the top of this page.  
Do several additional examples before assigning the page.

**ACTIVITIES**  
1. See Activities 1 and 4, page 275.  
2. Play "Missing Numbers" for division facts of 9.  
*Example*



3. Keep a time line of the important events of your day.

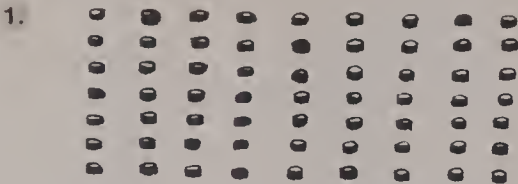


# Monster Hockey

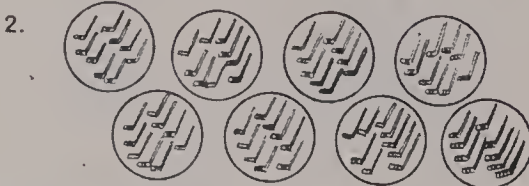


27 hockey cards.  
9 monsters want to share.  
How many hockey cards for each monster?

$27 \div 9 = 3$  or  $9 \overline{)27}^3$



63 hockey pucks.  
9 columns.  
How many in each column? **7**



72 hockey sticks.  
9 in each ring?  
How many rings. **8**



81 pop bottles.  
9 cases.  
How many in each case? **9**



54 players.  
9 on each team.  
How many teams? **6**

276 Dividing by 9

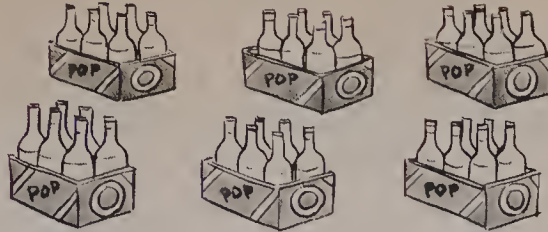
**Using the Book** Observe the artwork at the top of the page. Ask, "How many hockey cards are there in all? (27)" "How many groups (monsters want to share)? (9)" "How many in each group (hockey cards for each group)? (3)"

"What division stories can we write for this? ( $27 \div 9 = 3$  or  $9 \overline{)27}^3$ )"

Have the children use the accompanying arrays to help solve the problems. Answers are to be given in their workbooks.

# Monster Mysteries

1. There are 36 pop bottles.  
Each carton holds 6 bottles.  
How many cartons do you need for all the bottles? **6**  $6 \overline{)36}$



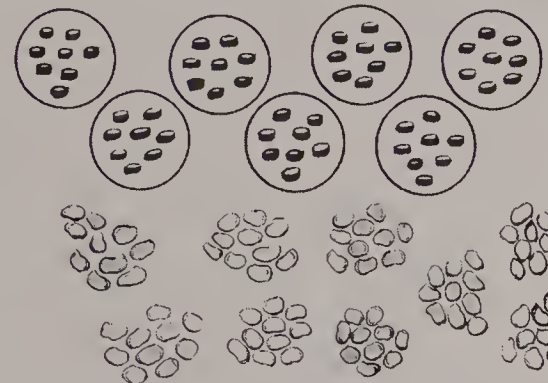
2. There are 5 monsters.  
Each monster has 7 hockey cards.  
How many cards do all the monsters have? **35**  $5 \times 7 = \blacksquare$



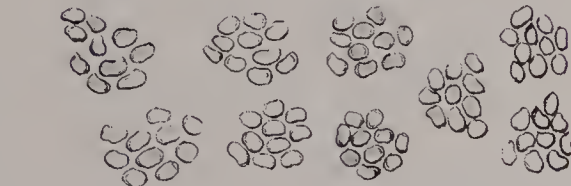
3. One monster has 6 teeth.  
How many teeth do 6 monsters have? **36**  $6 \times 6 = \blacksquare$



4. There were 56 hockey pucks.  
There were 8 pucks in each ring.  
How many rings were there? **7**  $8 \overline{)56}$



5. There are 90 potato chips.  
9 monsters want to share.  
How many potato chips will each monster get? **10**  $9 \overline{)90}$



Word problems 277

**Using the Book** Children work on this page independently using arrays to help solve the multiplication or division problems.

## OBJECTIVE

To solve word problems using multiplication and division

## PACING

Level A All  
Level B All  
Level C All

## MATERIALS

variety of concrete materials (bottle caps, cards, counters, etc.)

## SUGGESTIONS

**Initial Activity** Use bottle caps to demonstrate the first question. A small mat with 6 spaces could be used to represent each "case".

*Example*



The children would place a bottle cap in each space and determine how many "cases" would be required.

Do several similar examples with the children before assigning the page.

## ACTIVITIES

1. Have the children make up and exchange "mysteries" with their friends. You may want to supply the situation or facts for some groups.

*Example*

There were 64 \_\_\_\_\_.  
\_\_\_\_\_ monsters want to share.  
How many \_\_\_\_\_ does each monster get?

or

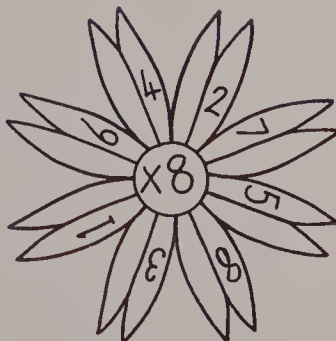
Write a problem using these numbers.  
7, 49

etc.

2. Set up a game such as:

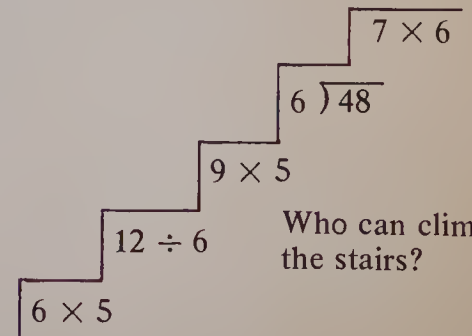
etc.

3.



Each petal is divided in two. Two factors are given and the product is to be placed in the other half of each petal.

4. Continue the "Monster Hunt" (page 275).



Who can climb the stairs?

Children try to climb the steps by answering the question on each step.

OBJECTIVE

To provide practice in multiplication and division

PACING

- Level A All
- Level B All
- Level C Odd-numbered exercises

RELATED AIDS

BFA COMP LAB I—119.

SUGGESTIONS

**Initial Activity** The children should work independently on these questions. If any children have unusual difficulty with this page, you may want to set up remedial work based on the type of facts found on this page.

ACTIVITIES

- 1. Use the "Patchwork Quilt" game in the Activity Reservoir. Modify to match the skills in this section.
- 2. Prepare cards such as:

Choose two problems from page 278 and draw arrays to go with them.

- 3. Prepare a set of instruction cards such as:

Choose one problem from page 278 and make a mini-mystery with it.

Multiplication and Division Practice

Multiply.

1.

8

× 5

40

2.

9

× 6

54

3.

8

× 1

8

4.

8

× 9

72

5.

9

× 0

0

6.

8

× 7

56

7.

9

× 10

90

8.

6

× 6

36

9.

8

× 3

24

10.

7

× 6

42

11.

6

× 8

48

12.

8

× 8

64

13.

7

× 5

35

14.

8

× 2

16

15.

9

× 8

72

16.

8

× 0

0

17.

9

× 9

81

18.

8

× 10

80

19.

9

× 5

45

20.

7

× 8

56

21.

8

× 6

48

22.

9

× 1

9

23.

8

× 4

32

24.

9

× 7

63

Divide.

25.

8

24

3

26.

9

81

9

27.

9

9

1

28.

8

72

9

29.

9

72

8

30.

8

40

5

31.

9

18

2

32.

9

27

3

33.

9

36

4

34.

7

56

8

35.

8

64

8

36.

6

42

7

37.

8

48

6

38.

9

45

5

39.

9

63

7

40.

7

35

5

41.

9

54

6

42.

8

32

4

43.

8

16

2

44.

7

63

9

**Using the Book** Have the children copy the work in their workbooks and complete by performing the operation required.

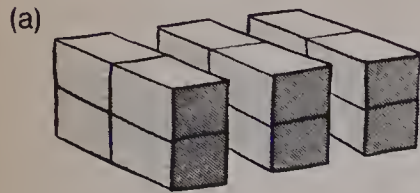


# Multiplying With Brackets



Brackets mean "Do Me First!"

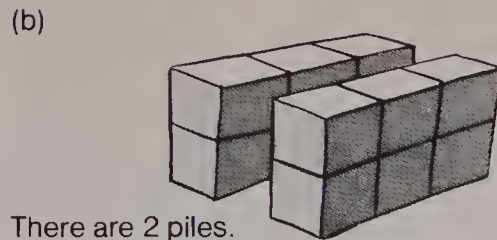
How many blocks in each pile?



In each pile, there are  
2 groups of 2.  
There are 3 piles.

$$(2 \times 2) \times 3$$

4       $\times 3 = 12$  blocks



There are 2 piles.  
In each pile, there are  
2 groups of 3.

$$2 \times (2 \times 3)$$

2       $\times 6 = 12$  blocks

$$(2 \times 2) \times 3 = 2 \times (2 \times 3)$$

Multiply two different ways. Use brackets.

- |                          |                              |                             |
|--------------------------|------------------------------|-----------------------------|
| 1. $1 \times 2 \times 3$ | (1 $\times$ 2) $\times$ 3    | 1 $\times$ (2 $\times$ 3)   |
| 2. $2 \times 3 \times 4$ | 2 $\times$ 3 $\times$ 4 = 24 | 1 $\times$ 6 = 6            |
| 5. $5 \times 1 \times 2$ | 1 $\times$ 4 $\times$ 2      | 4. $3 \times 2 \times 3$    |
| 8. $2 \times 2 \times 3$ | 6. $1 \times 1 \times 3$     | 7. $2 \times 1 \times 4$    |
|                          | 9. $3 \times 3 \times 1$     | ★10. $10 \times 2 \times 4$ |

Associativity 279

**Using the Book** Have the children demonstrate the examples given at the top of this page using blocks. Have the children stack and find the number of blocks in different ways. When you know children are certain of this concept, have them multiply in two different ways using brackets.

Answers:

2.  $(2 \times 3) \times 4 = 24$ ;  $2 \times (3 \times 4) = 24$       3.  $(1 \times 4) \times 2 = 8$ ;  $1 \times (4 \times 2) = 8$   
 4.  $(3 \times 2) \times 3 = 18$ ;  $3 \times (2 \times 3) = 18$       5.  $(5 \times 1) \times 2 = 10$ ;  $5 \times (1 \times 2) = 10$   
 6.  $(1 \times 1) \times 3 = 3$ ;  $1 \times (1 \times 3) = 3$       7.  $(2 \times 1) \times 4 = 8$ ;  $2 \times (1 \times 4) = 8$   
 8.  $(2 \times 2) \times 3 = 12$ ;  $2 \times (2 \times 3) = 12$       9.  $(3 \times 3) \times 1 = 9$ ;  $3 \times (3 \times 1) = 9$   
 10.  $(10 \times 2) \times 4 = 80$ ;  $10 \times (2 \times 4) = 80$

2. Prepare and distribute number wheels such as:



Have the children show their work showing that the product of each line is 24.

3. Prepare a deck of cards showing numerals from 0 to 10.

0 1 2 etc.

Children play in twos or small groups. One child randomly selects three cards, and multiplies them in the order chosen. Second child multiplies them in a different order. Children compare answers and discuss why the answers differ, if they do (see Example above with the zero card).

## OBJECTIVE

To review the concept of associativity

## PACING

Level A 1-9  
Level B 1-9  
Level C All

## MATERIALS

blocks, graph paper or gummed squares

## SUGGESTIONS

**Initial Activity** Use the overhead projector and transparencies or chart to show new concept of brackets. Tell children brackets mean "do the work inside first." Draw arrays and demonstrate brackets with them.

Example  $3 \times 3 \times 2$



In each group there are 3 groups of 3.  
There are 2 piles.

$$(3 \times 3) \times 2$$

9       $\times 2 = 18$   
or



$$3 \times (3 \times 2)$$

$3 \times 6 = 18$

In each group there are 3 groups of 2.  
There are 3 piles.

Do several more examples with children.

## ACTIVITIES

1. Have the children use gummed squares to represent the blocks, "stack" the "blocks" in two different ways, and then record the multiplication stories to go with them.

Example



$$(1 \times 2) \times 4$$

2       $\times 4 = 8$   
or



$$1 \times (2 \times 4)$$

1       $\times 8 = 8$

OBJECTIVE

To use a multiplication table to solve multiplication facts

PACING

- Level A 1-13
- Level B 1-13
- Level C All

MATERIALS

multiplication table — overhead transparency

SUGGESTIONS

**Initial Activity** Do several examples with the children using an overhead transparency of the multiplication table, or a chart.

The children should be given the same directions as found on this page.

ACTIVITIES

1. Have children write more questions of the type found on this page.
2. Use “The Multiplication Game” and/or the “Patchwork Quilt” game in the Activity Reservoir. Modify to match the skills in this section.
3. Have the children use the multiplication table to make fact cards and answer cards. Use these to play Snap or Concentration.
4. This table could be used as a reference for further activities in a “Monster Hunt”.

Multiplication Table

This is a **multiplication table**.  
It can help you to multiply numbers.

| X | 0 | 1 | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  |
|---|---|---|----|----|----|----|----|----|----|----|
| 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| 1 | 0 | 1 | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  |
| 2 | 0 | 2 | 4  | 6  | 8  | 10 | 12 | 14 | 16 | 18 |
| 3 | 0 | 3 | 6  | 9  | 12 | 15 | 18 | 21 | 24 | 27 |
| 4 | 0 | 4 | 8  | 12 | 16 | 20 | 24 | 28 | 32 | 36 |
| 5 | 0 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 |
| 6 | 0 | 6 | 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54 |
| 7 | 0 | 7 | 14 | 21 | 28 | 35 | 42 | 49 | 56 | 63 |
| 8 | 0 | 8 | 16 | 24 | 32 | 40 | 48 | 56 | 64 | 72 |
| 9 | 0 | 9 | 18 | 27 | 36 | 45 | 54 | 63 | 72 | 81 |

6 × 4

- (a) Find 6 in the blue column.
- (b) Go right from 6.
- (c) Find 4 in the red row.
- (d) Go down from 4.

The answer is in the square where the two number paths meet.

6 × 4 = 24

1. 7 × 5 = ■ 35

4. 9 × 4 = ■ 36

7. 8 × 6 = ■ 48

10. 9 × 8 = ■ 72

13. 8 × 8 = ■ 64
2. 8 × 4 = ■ 32

5. 5 × 3 = ■ 15

8. 7 × 7 = ■ 49

11. 4 × 7 = ■ 28

14. 8 × 7 = ■ 56
3. 6 × 6 = ■ 36

6. 7 × 9 = ■ 63

9. 5 × 8 = ■ 40

12. 6 × 9 = ■ 54

15. 9 × 3 = ■ 27

**Using the Book** Draw the children’s attention to the multiplication table on the left-hand side and the multiplication story on the right-hand side. Ask, “With what two factors are we working?” Tell children to find the blue 6 and go right. Tell them to find the red 4 and go down. Tell them to stop when the two paths meet. What number is in that square? (24) That is our number. We can say 6 × 4 = 24.

Assign the page having the children fill in each ■ using the multiplication table to get the answers.

# Monster Multiplication (By 10)

How much?

1 dime = 10¢



4 dimes.


$$4 \times 10¢ = 40¢$$

8 dimes.


$$8 \times 10¢ = 80¢$$



Write the multiplication stories for 10.

1.   $2 \times 10 = \blacksquare 20$

2.   $4 \times 10 = \blacksquare 40$

3.   $6 \times 10 = \blacksquare 60$

4.   $8 \times 10 = \blacksquare 80$

Copy and complete.

5.  $7 \times 10 = \blacksquare 70$       6.  $5 \times 10 = \blacksquare 50$       7.  $4 \times 10 = \blacksquare 40$

8.  $8 \times 10 = \blacksquare 80$       9.  $1 \times 10 = \blacksquare 10$       10.  $2 \times 10 = \blacksquare 20$

11.  $3 \times 10 = \blacksquare 30$       12.  $9 \times 10 = \blacksquare 90$       13.  $0 \times 10 = \blacksquare 0$

Watch these.

14.  $10 \times 10 = \blacksquare 100$       15.  $40 \times 10 = \blacksquare 400$       16.  $50 \times 10 = \blacksquare 500$

17.  $80 \times 10 = \blacksquare 800$       18.  $30 \times 10 = \blacksquare 300$       19.  $60 \times 10 = \blacksquare 600$

**Using the Book** Have the children focus their attention on the artwork at the top of the page. Ask, "How much is 1 dime equal to? (10¢)" "What multiplication fact could we write for that? ( $1 \times 10 = 10$ )" "If we had 4 dimes, how much would we have? (40¢)" "What multiplication fact could we write for that? ( $4 \times 10 = 40$ )" "If we had 8 dimes, how much would we have? (80¢)" "What multiplication fact could we write for that? ( $8 \times 10 = 80$ )"

Assign the page. Have the children fill in the answers for each  $\blacksquare$  using the arrays to help them in the first four exercises. Exercises 1, 5, and 14 can be verified in the back of the book.

## OBJECTIVE

To review and reinforce multiplying by 10

## PACING

Level A 1-13

Level B All

Level C 5-19

## MATERIALS

pegs bundled in groups of 10, dimes

## RELATED AIDS

BFA COMP LAB I—96, 102.

## SUGGESTIONS

**Initial Activity** Review counting by 10's.

Relate multiplying by 10's to work with money.

Use pegs or other materials put in groups of 10. Have the children take a handful and record how many they have.

*Example*

4 bundles of 10 pegs in a handful.

$$4 \times 10 = 40 \text{ pegs.}$$

## ACTIVITIES

1. Have the children extend a multiplication table to include multiplying by 10.

2. Use the "Numbers Game" in the Activity Reservoir. Modify to match the skills in this section.

3. Problem of the Week #2.



## OBJECTIVE

To extend previous work on multiplying by 10 to multiplying by 100

## PACING

Level A 1-33

Level B 1-33

Level C 9-33

## SUGGESTIONS

**Initial Activity** Review multiplying by 10.

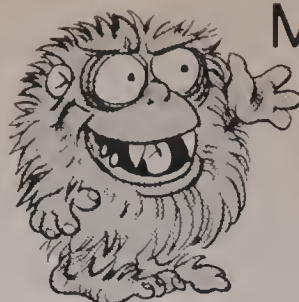
Do a basic review of place value and zero as a placeholder to reinforce the different values of 10 and 100.

## ACTIVITIES

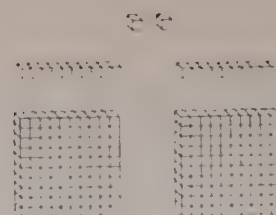
1. Have the children make up and exchange questions using multiplying by 10 and 100.

2. Use the "Patchwork Quilt" game in the Activity Reservoir. Use ( $\times 10$ ) and ( $\times 100$ ) buttons.

3. See Place-Value Game in the Activity Reservoir.



## Monster Multiplication (By 100)



$1 \times 2 = 2$

$10 \times 2 = 20$

$100 \times 2 = 200$

Multiply by 10.

1.  $6 \times 10 = 60$

2.  $5 \times 10 = 50$

3.  $9 \times 10 = 90$

4.  $7 \times 10 = 70$

5.  $2 \times 10 = 20$

6.  $3 \times 10 = 30$

7.  $8 \times 10 = 80$

8.  $4 \times 10 = 40$

9.  $50 \times 10 = 500$

10.  $20 \times 10 = 200$

11.  $30 \times 10 = 300$

12.  $70 \times 10 = 700$

Multiply by 100.

13.  $5 \times 100 = 500$

14.  $3 \times 100 = 300$

15.  $4 \times 100 = 400$

16.  $1 \times 100 = 100$

17.  $2 \times 100 = 200$

18.  $6 \times 100 = 600$

19.  $8 \times 100 = 800$

20.  $7 \times 100 = 700$

21.  $50 \times 100 = 5000$

22.  $20 \times 100 = 2000$

23.  $30 \times 100 = 3000$

24.  $70 \times 100 = 7000$

Copy and complete.

25.  $10 \times 40 = \blacksquare 400$  26.  $100 \times 6 = \blacksquare 600$  27.  $10 \times 60 = \blacksquare 600$

28.  $100 \times 7 = \blacksquare 700$  29.  $100 \times 90 = \blacksquare 9000$  30.  $100 \times 40 = \blacksquare 4000$

31.  $100 \times 50 = \blacksquare 5000$  32.  $100 \times 70 = \blacksquare 7000$  33.  $100 \times 100 = \blacksquare 10\,000$

★ 34. What have you discovered about multiplying by 10 and 100? *The number of zeros in the answer is the same as the number of zeros in the 2 factors.*

282 Multiplying by 100

**Using the Book** Have the children observe the artwork at the top of the page. Emphasize the relationship between the zeros in the question and the answer.

*Example*

$$3 \times 10 = 30$$

One zero  $\longrightarrow$  multiplying by 10.

$$3 \times 100 = 300$$

Two zeros  $\longrightarrow$  multiplying by 100.

Do several examples with the children. Assign the page. Have the children copy the work and perform the operation required.

# Monster Division (By 10)



40 beans in a jar.

Put the beans on 10 plates.

How many beans on each plate?

$$\begin{array}{r} 4 \\ 10 \overline{)40} \end{array} \text{ ----- 4 beans on each plate.}$$

Copy and complete.

- |                             |                             |                                 |
|-----------------------------|-----------------------------|---------------------------------|
| 1. $10 \overline{)30}$ 3    | 2. $10 \overline{)60}$ 6    | 3. $10 \overline{)90}$ 9        |
| 4. $10 \overline{)10}$ 1    | 5. $10 \overline{)50}$ 5    | 6. $10 \overline{)20}$ 2        |
| 7. $10 \overline{)40}$ 4    | 8. $10 \overline{)70}$ 7    | 9. $10 \overline{)80}$ 8        |
| 10. $10 \overline{)100}$ 10 | 11. $10 \overline{)500}$ 50 | 12. $10 \overline{)300}$ 30     |
| 13. $10 \overline{)400}$ 40 | 14. $10 \overline{)800}$ 80 | 15. $10 \overline{)600}$ 60     |
| 16. $10 \overline{)200}$ 20 | 17. $10 \overline{)700}$ 70 | ★ 18. $10 \overline{)1000}$ 100 |

- |   |  |
|---|--|
| 19. Joan has 90¢ in dimes.<br>How many dimes does she have? 9                                     | 20. A piggy bank has 60¢ in dimes.<br>How many dimes in the bank? 6                    |
| 21. 300 sandwiches at a picnic.<br>10 monsters want to share.<br>How many sandwiches for each? 30 | 22. 70 children want to play hockey.<br>10 children on each team.<br>How many teams? 7 |

Dividing by 10 283

**Using the Book** While observing the work at the top of the page ask, "How many beans in all? (4)" "How many groups (plates of beans)? (10)" "How many in each group (beans on plate)? (4)" "What division fact can we write for this?"

$$\left( \begin{array}{r} 4 \\ 10 \overline{)40} \end{array} \right)$$

Have the children copy and complete the exercises in their workbooks.

## OBJECTIVE

To review and reinforce dividing by 10

## PACING

Level A 1-17, 19-22

Level B 1-17, 19-22

Level C All

## MATERIALS

beans, paper plates

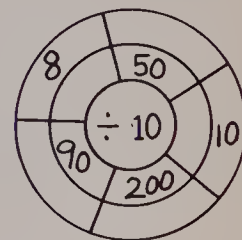
## SUGGESTIONS

**Initial Activity** See page 233 for initial work on dividing by 10.

Review counting by 10's. Do several examples similar to that at the top of the page before assigning the page. Have the children record from the examples.

## ACTIVITIES

1. Have the children make up and exchange questions involving dividing by 10.
2. Illustrate one of the problems made up in Activity 1.
3. Prepare division fact wheels.



## OBJECTIVE

To use a multiplication table to help with division

## PACING

Level A All  
Level B All  
Level C All

## MATERIALS

multiplication table — overhead transparency or chart

## SUGGESTIONS

**Initial Activity** Emphasize the inverse nature of multiplication and division. Do several examples with the children using the overhead transparency or chart of the multiplication table.

The children should be given the same directions as found on this page.

## ACTIVITIES

1. Have the children write their own questions to do in addition to the sixteen questions on this page.

2. Prepare cards. The children provide the operation and number.

24 ÷ 8 = 3    5 × 5 = 25    etc.

3. Have children pick five division questions from the bottom of page 284 and write the related multiplication question.

## Multiplication Table

This is a multiplication table.  
It can help you to divide.

| X | 0 | 1 | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  |
|---|---|---|----|----|----|----|----|----|----|----|
| 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| 1 | 0 | 1 | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  |
| 2 | 0 | 2 | 4  | 6  | 8  | 10 | 12 | 14 | 16 | 18 |
| 3 | 0 | 3 | 6  | 9  | 12 | 15 | 18 | 21 | 24 | 27 |
| 4 | 0 | 4 | 8  | 12 | 16 | 20 | 24 | 28 | 32 | 36 |
| 5 | 0 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 |
| 6 | 0 | 6 | 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54 |
| 7 | 0 | 7 | 14 | 21 | 28 | 35 | 42 | 49 | 56 | 63 |
| 8 | 0 | 8 | 16 | 24 | 32 | 40 | 48 | 56 | 64 | 72 |
| 9 | 0 | 9 | 18 | 27 | 36 | 45 | 54 | 63 | 72 | 81 |

$$4 \overline{)24}$$

- (a) Find 4 in the top row.
- (b) Go down to 24.
- (c) Go left to the red column.

The answer is in the box in the red column.

$$\begin{array}{r} 6 \\ 4 \overline{)24} \end{array}$$

Copy and complete using the table above.

- |                          |                          |                          |                          |
|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. $6 \overline{)36}$ 6  | 2. $8 \overline{)56}$ 7  | 3. $9 \overline{)72}$ 8  | 4. $4 \overline{)36}$ 9  |
| 5. $5 \overline{)45}$ 9  | 6. $7 \overline{)49}$ 7  | 7. $8 \overline{)48}$ 6  | 8. $6 \overline{)42}$ 7  |
| 9. $3 \overline{)27}$ 9  | 10. $4 \overline{)32}$ 8 | 11. $7 \overline{)63}$ 9 | 12. $3 \overline{)27}$ 9 |
| 13. $5 \overline{)40}$ 8 | 14. $9 \overline{)81}$ 9 | 15. $8 \overline{)64}$ 8 | 16. $5 \overline{)35}$ 7 |

284 Multiplication table

**Using the Book** Make children aware of the multiplication table and the

question  $4 \overline{)24}$ . Tell children to find 4 in the top row and follow down the path to 24, then go left to the red number straight across. This number (6) is the answer.

$$\therefore \begin{array}{r} 6 \\ 4 \overline{)24} \end{array}$$

Have the children copy the division questions in their workbooks and answer using the multiplication table when necessary. Exercises 1, 2, and 3 may be verified in the back of the book.



# Practice

- |  |   |  |   |  |
|--|---|--|---|--|
| 1. (a) $\begin{array}{r} 4 \\ \times 6 \\ \hline 24 \end{array}$ | (b) $\begin{array}{r} 5 \\ \times 9 \\ \hline 45 \end{array}$ | (c) $\begin{array}{r} 6 \\ \times 7 \\ \hline 42 \end{array}$  | (d) $\begin{array}{r} 3 \\ \times 8 \\ \hline 24 \end{array}$ | (e) $\begin{array}{r} 6 \\ \times 6 \\ \hline 36 \end{array}$  |
| 2. (a) $\begin{array}{r} 5 \\ \times 8 \\ \hline 40 \end{array}$ | (b) $\begin{array}{r} 1 \\ \times 9 \\ \hline 9 \end{array}$  | (c) $\begin{array}{r} 3 \\ \times 10 \\ \hline 30 \end{array}$ | (d) $\begin{array}{r} 7 \\ \times 7 \\ \hline 49 \end{array}$ | (e) $\begin{array}{r} 5 \\ \times 10 \\ \hline 50 \end{array}$ |
| 3. (a) $\begin{array}{r} 9 \\ \times 7 \\ \hline 63 \end{array}$ | (b) $\begin{array}{r} 7 \\ \times 6 \\ \hline 42 \end{array}$ | (c) $\begin{array}{r} 7 \\ \times 10 \\ \hline 70 \end{array}$ | (d) $\begin{array}{r} 9 \\ \times 8 \\ \hline 72 \end{array}$ | (e) $\begin{array}{r} 9 \\ \times 6 \\ \hline 54 \end{array}$  |
| 4. (a) $\begin{array}{r} 4 \\ \times 9 \\ \hline 36 \end{array}$ | (b) $\begin{array}{r} 8 \\ \times 7 \\ \hline 56 \end{array}$ | (c) $\begin{array}{r} 2 \\ \times 8 \\ \hline 16 \end{array}$  | (d) $\begin{array}{r} 5 \\ \times 6 \\ \hline 30 \end{array}$ | (e) $\begin{array}{r} 4 \\ \times 8 \\ \hline 32 \end{array}$  |
| 5. (a) $8 \overline{)64} \text{ 8}$                              | (b) $6 \overline{)24} \text{ 4}$                              | (c) $9 \overline{)72} \text{ 8}$                               | (d) $7 \overline{)21} \text{ 3}$                              | (e) $7 \overline{)35} \text{ 5}$                               |
| 6. (a) $8 \overline{)32} \text{ 4}$                              | (b) $9 \overline{)54} \text{ 6}$                              | (c) $10 \overline{)90} \text{ 9}$                              | (d) $9 \overline{)18} \text{ 2}$                              | (e) $7 \overline{)42} \text{ 6}$                               |
| 7. (a) $6 \overline{)36} \text{ 6}$                              | (b) $8 \overline{)72} \text{ 9}$                              | (c) $7 \overline{)63} \text{ 9}$                               | (d) $8 \overline{)40} \text{ 5}$                              | (e) $7 \overline{)56} \text{ 8}$                               |
| 8. (a) $9 \overline{)36} \text{ 4}$                              | (b) $6 \overline{)48} \text{ 8}$                              | (c) $8 \overline{)16} \text{ 2}$                               | (d) $9 \overline{)81} \text{ 9}$                              | (e) $9 \overline{)63} \text{ 7}$                               |



## BRAINTICKLER

Write all the multiplication stories from  $9 \times 1 = 9$  to  $9 \times 10 = 90$ .

Add all the single digits in each answer and find a surprise!

Multiplication practice 285

**Using the Book** The children should work independently on these questions. If any children have unusual difficulty with this page, you may want to set up remedial work based on the type of facts found on this page.

**Braintickler:** All the single digits in each answer add up to 9.

## OBJECTIVE

To provide practice in multiplication and division

## PACING

Level A All

Level B All

Level C Odd-numbered exercises

## RELATED AIDS

HMS—DM77.

## ACTIVITIES

Use "The Multiplication Game" and/or the "Patchwork Quilt" game in the Activity Reservoir. Modify to match the skills in this section.

**Answers:**  
**Braintickler**  $9 \times 1 = 9$ ,  $9 \times 2 = 18$ ,  $9 \times 3 = 27$ ,  $9 \times 4 = 36$ ,  $9 \times 5 = 45$ ,  $9 \times 6 = 54$ ,  
 $9 \times 7 = 63$ ,  $9 \times 8 = 72$ ,  $9 \times 9 = 81$ ,  $9 \times 10 = 90$ .  
 The single digits in each answer add up to 9.

OBJECTIVE

To review the comparison of products

PACING

- Level A 1-12
- Level B 1-12
- Level C All

MATERIALS

variety of concrete materials, graph paper

SUGGESTIONS

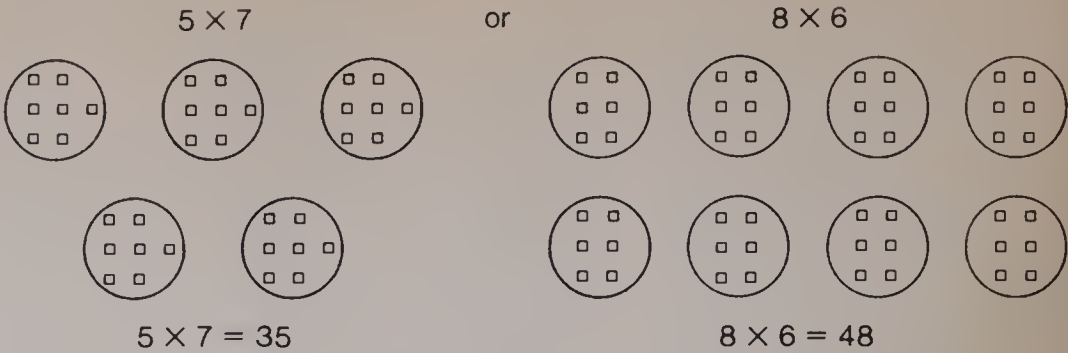
- Initial Activity** Review the symbols  $<$ ,  $>$ , and  $=$ .  
Using concrete materials, demonstrate the example at the top of this page.  
Do several examples with the children before assigning the page.

ACTIVITIES

1. Have the children make up comparison riddles similar to the challenge question at the top of this page.
2. Use the "Numbers Game" in the Activity Reservoir. Modify to match the skills in this section.
3. See Problem of the Week #21.

Comparing Products

Which is more?

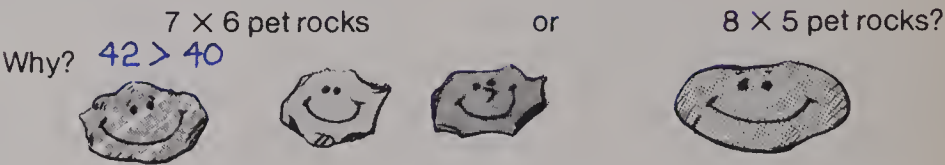


So:  $5 \times 7 < 8 \times 6$ .

Put  $<$ ,  $>$ , or  $=$  in the  $\bullet$ . Copy and complete.

- |                                       |                                       |                                       |
|---------------------------------------|---------------------------------------|---------------------------------------|
| 1. $4 \times 6 \bullet 5 \times 5 <$  | 2. $8 \times 7 \bullet 8 \times 8 <$  | 3. $6 \times 8 \bullet 8 \times 6 =$  |
| 4. $4 \times 8 \bullet 5 \times 9 <$  | 5. $9 \times 8 \bullet 7 \times 6 >$  | 6. $3 \times 7 \bullet 5 \times 3 >$  |
| 7. $7 \times 5 \bullet 5 \times 7 =$  | 8. $8 \times 7 \bullet 6 \times 5 >$  | 9. $6 \times 7 \bullet 7 \times 6 =$  |
| 10. $7 \times 4 \bullet 6 \times 3 >$ | 11. $8 \times 9 \bullet 9 \times 8 =$ | 12. $5 \times 4 \bullet 6 \times 6 <$ |

★ Which would you rather have:  $7 \times 6$  pet rocks



**Using the Book** Have the children focus their attention on the artwork at the top of the page. Ask, "What is the product of  $5 \times 7$ ? (35)" "What is the product of  $8 \times 6$ ? (48)" Ask, "Which is larger? (48)" "What sign is used for smaller than? ( $<$ )" "What can we say about  $5 \times 7$  and  $8 \times 6$ ? ( $5 \times 7 < 8 \times 6$ )"

Have the children copy and complete the work in their workbooks using the signs  $<$ ,  $>$ ,  $=$ .

**Pet Rocks:** Be prepared to accept all answers. The children may enjoy collecting and preparing some pet rocks for the activity.

# Mysteries

1. Every child had 10 stars for math.  
There were 28 children in the class.  
How many stars were there altogether?

280



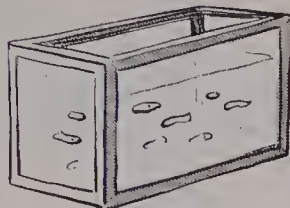
2. Jane has 80¢ in dimes.  
How many dimes does she have?

8



3. There were 120 polliwogs in the tank.  
Ten children will take them back to the pond.  
How many polliwogs will each child carry?

12



4. Jim's class cleaned the play area.  
Each child picked up 10 pieces of paper.  
There are 32 children in the class.  
How many pieces of paper did they pick up altogether?

320



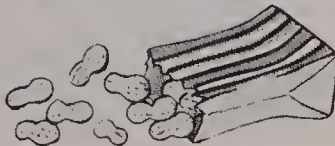
5. Steven has \$1.50 in dimes.  
How many dimes does he have?

15



6. Tom shared 99 peanuts with 9 friends.  
How many peanuts did each friend get?

9 peanuts and 9 left over



## OBJECTIVE

To solve word problems using multiplication and division

## PACING

Level A 1-4

Level B 1-4

Level C All

## MATERIALS

gummed stars

## RELATED AIDS

HMS—DM78.

## SUGGESTIONS

**Initial Activity** Make up a graph to illustrate Exercise 1. Discuss and record with the class. Do several similar examples before assigning the page.

## ACTIVITIES

1. Have the children make up and exchange "mysteries" with their friends. Some groups may require assistance with this activity by supplying either basic facts or situations for some problems (see page 277).

2. Problem of the Week #22.

**Using the Book** Assign the page. Have the children work independently in their workbooks. Note pacing for "starred" questions.



OBJECTIVE

To introduce the concept of parts of a set

PACING

- Level A All
- Level B All
- Level C All

MATERIALS

counters, paper strips (for folding), Unifix cubes

RELATED AIDS

BFA COMP LAB I—72.

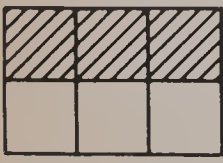
SUGGESTIONS

**Initial Activity** Review the basic concepts of fractions in previous work in the text (pages 125 to 129).

Establish the idea that fractions can represent not only part of one whole object but also parts of a set of objects. Use concrete materials to represent the sets of objects pictured on this page. It may be helpful to provide mats which have been divided into halves, thirds, fourths, and so on, to provide a place for manipulating the sets.

Paper-folding activities using graph paper may help to illustrate the idea of parts of a set.

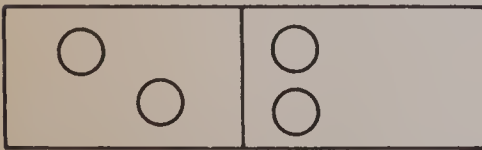
Example



1/2 are coloured.

ACTIVITIES

- Find cutouts from magazines/catalogues. Separate your groups in (a) halves or (b) thirds or (c) fourths.
- Make cards. Colour 1/2 yellow and 1/2 red.



Colour 1/4 blue, 1/4 black, 1/4 green, and 1/4 orange.

### Parts of a Set

The skates are separated into thirds.

$\frac{1}{3}$

1. Which of the groups are separated into halves? thirds? fourths? (a), (c); (b)

(a)

(b)

(c)

2. What fraction of the skaters have fallen? one third

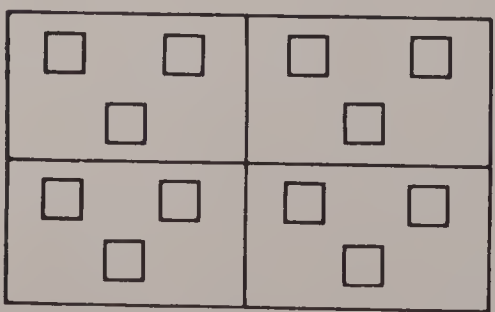
one half    one third    one sixth

3. What fraction of the skaters are holding hands? one fifth

one half    one fourth    one fifth

**Using the Book** Draw attention to the artwork at the top of the page. Ask children: "How many groups of skates are there? (3)" "When a group of objects is separated into 3 equal parts, what do we call each part? ( $\frac{1}{3}$ )" Say: "The skates are separated into thirds and each part is  $\frac{1}{3}$ ."

Assign the page. Have children select and copy the correct answer for each question. Point out to the children that three possible answers appear at the bottom of their books for Exercises 2 and 3. They should choose the correct one.



etc.

3. Play Bingo as outlined on page 272. Put a list of fractions on the chalkboard for children to choose from. Call out or display pictures of fractions (of wholes and sets). Each child covers up that fraction when it is called or displayed. Usual Bingo rules apply.

# Doctor

1. 7 monsters to see Doctor Quack.  
3 blue pills for each.  
How many blue pills? **21**
2. 45 patients in waiting room.  
5 doctors to see the patients.  
How many patients for each doctor? **9**
3. 5 bottles of cotton balls.  
10 cotton balls in each bottle.  
How many cotton balls altogether? **50**
4. 56 doctors in the hospital.  
8 doctors on each floor.  
How many floors in the hospital? **7**
5. 5 babies in each nursery room.  
6 nursery rooms in the hospital.  
How many babies? **30**
6. The hospital is having a blood drive.  
48 people come to give blood.  
6 nurses are on duty.  
How many people for each nurse? **8**



Word problems 289

**Using the Book** Tell the children that they will be using multiplication or division to solve the questions. Work is to be done independently. Assign the page being sure children are familiar with the vocabulary (see above).

## OBJECTIVE

To solve word problems using multiplication and division

## PACING

Level A All  
Level B All  
Level C All

## VOCABULARY

patient, nursery, hospital, blood drive, on duty

## RELATED AIDS

HMS—DM79.

## BACKGROUND

See Chapter Overview.

## SUGGESTIONS

**Initial Activity** Discuss the different kinds of doctors of which the children may be aware.

Set up a display of articles and pictures related to the doctor's work.

Make a timetable to show how doctors may use their time.

Measure and find the mass of each child in the class.

Take each child's temperature and chart the results to answer the question, "What is normal?"

## ACTIVITIES

1. Make a graph of the masses of children in the room from least  $\longrightarrow$  most.

2. Make a graph of the height of children in the room from tallest  $\longrightarrow$  shortest.

3. Illustrate a picture of your feelings when you go to the doctor.



**OBJECTIVE**  
To introduce division with remainders

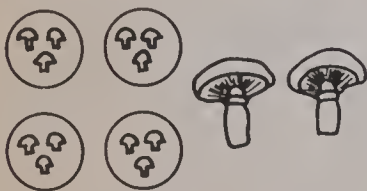
**PACING**  
Level A All  
Level B All  
Level C All

**MATERIALS**  
variety of concrete materials of the type pictured on these two pages

**RELATED AIDS**  
BFA COMP LAB I—121-124.

**SUGGESTIONS**  
**Initial Activity** Do concrete examples of sharing experiences with the children. Ensure that there will be "leftovers".  
Record these experiences in numerical form.  
Introduce writing "R" to indicate the "remainder".

**ACTIVITIES**  
1. Have the children make "Leftover Soup". Use four circles to represent soup bowls and bottle caps for "mushrooms". Have the children indicate how they distribute certain items and how many are "left over".  
*Example*  
14 mushrooms



$$\begin{array}{r} 3 \text{ and } 2R \\ 4 \overline{)14} \end{array}$$
  
Make a real "Leftover Soup"!  
2. Provide a card such as:

Make up a "leftover" problem for your friend. See if your friend can answer it. Help if your friend has trouble.

3. Prepare cards. Use  $<$ ,  $=$ ,  $>$ .

$3 \times 4 \square 15 \div 5$

$2 \div 2 \square 7 \div 7$

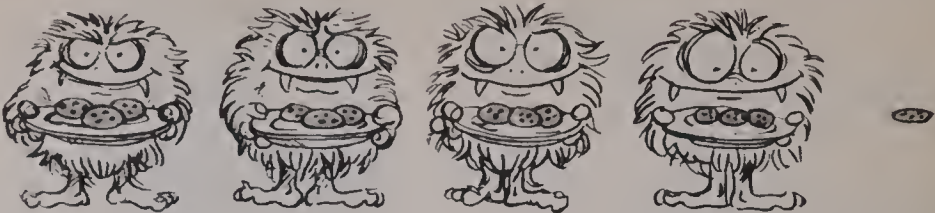
$16 \div 4 \square 2 \times 3$

etc.

# "Leftovers"



There are 13 cookies.  
A monster put 3 on each plate.  
How many plates?  
How many "leftovers"?



How many groups of 3 in 13?  
4 groups of 3 = 12 and 1 left over.  
So there are 4 plates and  
1 cookie is left over.

The number "left over" is called the remainder. You can write it as R to save time.

$$\begin{array}{r} 4 \text{ and } 1 \text{ left over} \\ 3 \overline{)13} \end{array} \qquad \begin{array}{r} 4R1 \\ 3 \overline{)13} \end{array}$$

Divide. Find the number of groups and the remainder.

17 stars.  
5 in each group.

$$\begin{array}{r} 3R2 \\ 5 \overline{)17} \end{array}$$

**Using the Book** Focus attention on the artwork at the top of the page. Ask, "How many cookies are there? (13)" "How many are on each plate? (3)" "How many plates are there? (4)" "How many are left over? (1)" Ask, "How many groups of 3 are there in 13? (4)" "How many are left over? (1)" 4 groups of 3 = 12. 1 left over. Say: "We have 4 plates and 1 left over!"  
Copy:

"The number 'left over' is called the remainder.  
You can write it as R to save time.

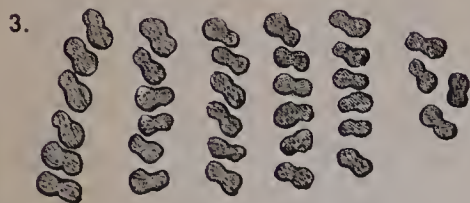
$$\begin{array}{r} 4 \text{ and } 1 \text{ left over} \\ 3 \overline{)13} \end{array} \qquad \begin{array}{r} 4R1 \\ 3 \overline{)13} \end{array} "$$

on a separate strip of paper and post as an important rule of division.  
Have the children copy the work into their workbooks and fill in each  $\square$ .  
The arrays will help those who need it.





14 mushrooms.  
3 in each group.

$$\begin{array}{r} 4 \text{ R } 2 \\ 3 \overline{)14} \end{array}$$


34 peanuts.  
6 in each group.

$$\begin{array}{r} 5 \text{ R } 4 \\ 6 \overline{)34} \end{array}$$


19 flowers.  
4 in each group.

$$\begin{array}{r} 4 \text{ R } 3 \\ 4 \overline{)19} \end{array}$$


24 marbles.  
5 in each group.

$$\begin{array}{r} 4 \text{ R } 4 \\ 5 \overline{)24} \end{array}$$


10 monsters.  
3 in each group.

$$\begin{array}{r} 3 \text{ R } 1 \\ 3 \overline{)10} \end{array}$$


15 hats.  
2 in each group.

$$\begin{array}{r} 7 \text{ R } 1 \\ 2 \overline{)15} \end{array}$$


25 cookies.  
4 in each group.

$$\begin{array}{r} 6 \text{ R } 1 \\ 4 \overline{)25} \end{array}$$

## OBJECTIVE

To evaluate achievement of the chapter objectives

## PACING

Level A All  
Level B All  
Level C All

## RELATED AIDS

HMS—DM1 and DM80.

## Chapter Test

Multiply.

1. (a)  $\begin{array}{r} 7 \\ \times 9 \\ \hline \end{array}$

2. (a)  $\begin{array}{r} 63 \\ 9 \\ \times 10 \\ \hline \end{array}$

3. (a)  $\begin{array}{r} 90 \\ 4 \\ \times 10 \\ \hline \end{array}$

4. (a)  $\begin{array}{r} 40 \\ 2 \\ \times 9 \\ \hline \end{array}$

(b)  $\begin{array}{r} 8 \\ \times 6 \\ \hline \end{array}$

(b)  $\begin{array}{r} 48 \\ 9 \\ \times 6 \\ \hline \end{array}$

(b)  $\begin{array}{r} 54 \\ 4 \\ \times 8 \\ \hline \end{array}$

(b)  $\begin{array}{r} 32 \\ 7 \\ \times 10 \\ \hline \end{array}$

(c)  $\begin{array}{r} 6 \\ \times 7 \\ \hline \end{array}$

(c)  $\begin{array}{r} 42 \\ 6 \\ \times 6 \\ \hline \end{array}$

(c)  $\begin{array}{r} 36 \\ 4 \\ \times 9 \\ \hline \end{array}$

(c)  $\begin{array}{r} 36 \\ 5 \\ \times 9 \\ \hline \end{array}$

(d)  $\begin{array}{r} 7 \\ \times 4 \\ \hline \end{array}$

(d)  $\begin{array}{r} 28 \\ 8 \\ \times 8 \\ \hline \end{array}$

(d)  $\begin{array}{r} 64 \\ 6 \\ \times 8 \\ \hline \end{array}$

(d)  $\begin{array}{r} 48 \\ 8 \\ \times 7 \\ \hline \end{array}$

Divide.

5. (a)  $7 \overline{)49} \quad 7$

(b)  $6 \overline{)48} \quad 8$

(c)  $9 \overline{)63} \quad 7$

(d)  $9 \overline{)45} \quad 5$

6. (a)  $8 \overline{)48} \quad 6$

(b)  $8 \overline{)40} \quad 5$

(c)  $7 \overline{)63} \quad 9$

(d)  $6 \overline{)24} \quad 4$

7. (a)  $9 \overline{)72} \quad 8$

(b)  $10 \overline{)40} \quad 4$

(c)  $7 \overline{)28} \quad 4$

(d)  $6 \overline{)60} \quad 10$

8. (a)  $6 \overline{)42} \quad 7$

(b)  $9 \overline{)27} \quad 3$

(c)  $8 \overline{)24} \quad 3$

(d)  $9 \overline{)81} \quad 9$

9. (a)  $10 \overline{)80} \quad 8$

(b)  $8 \overline{)56} \quad 7$

(c)  $7 \overline{)35} \quad 5$

(d)  $6 \overline{)36} \quad 6$

10. There were 81 hockey cards.  
Each child got 9 cards.  
How many children? **9**

11. There were 29 cards.  
7 monsters will share.  
How many cards for each? **4**  
How many cards left over? **1**

292 Chapter 10 test

**Using the Book** Each child should do this test independently under supervision. Assistance should be given only when the instructions are not understood. After the work has been corrected, you should provide appropriate remedial work. You may wish to reteach if a large number of children had difficulty with a particular topic or concept.

The following chart will help in this regard. The specific objectives are listed in the Chapter Overview (see page 264).

An alternate Chapter Test can be found in the Holt Mathematics System Duplicating Masters available for use with this grade level.

| Test Item        | Objective | Text Page Number |
|------------------|-----------|------------------|
| 1-4              | A         | 270              |
| 2(a), 3(a), 4(b) | B         | 281              |
| 5-9              | C         | 276              |
| 7(b), 9(a)       | D         | 283              |
| 10, 11           | E         | 277              |
| 11               | F         | 290              |

# Cumulative Review

## OBJECTIVE

To review and test selected concepts and skills previously covered

Add.

|        |  |     |  |     |   |     |   |     |  |
|--------|--|-----|--|-----|---|-----|---|-----|--|
| 1. (a) | $\begin{array}{r} 34 \\ + 28 \\ \hline 62 \end{array}$ | (b) | $\begin{array}{r} 165 \\ + 74 \\ \hline 239 \end{array}$ | (c) | $\begin{array}{r} 0.2 \\ + 0.5 \\ \hline 0.7 \end{array}$ | (d) | $\begin{array}{r} 0.4 \\ + 0.5 \\ \hline 0.9 \end{array}$ | (e) | $\begin{array}{r} \$2.63 \\ + 0.32 \\ \hline \$2.95 \end{array}$ |
|--------|--|-----|--|-----|---|-----|---|-----|--|

Subtract.

|        |  |     |   |     |   |     |   |     |  |
|--------|--|-----|---|-----|---|-----|---|-----|--|
| 2. (a) | $\begin{array}{r} 53 \\ - 15 \\ \hline 38 \end{array}$ | (b) | $\begin{array}{r} 467 \\ - 168 \\ \hline 299 \end{array}$ | (c) | $\begin{array}{r} 0.5 \\ - 0.3 \\ \hline 0.2 \end{array}$ | (d) | $\begin{array}{r} 0.9 \\ - 0.6 \\ \hline 0.3 \end{array}$ | (e) | $\begin{array}{r} \$1.62 \\ - 1.24 \\ \hline \$0.38 \end{array}$ |
|--------|--|-----|---|-----|---|-----|---|-----|--|

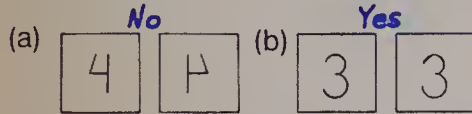
Multiply.

|        |   |     |   |     |  |     |  |     |  |
|--------|---|-----|---|-----|--|-----|--|-----|--|
| 3. (a) | $\begin{array}{r} 8 \\ \times 9 \\ \hline 72 \end{array}$ | (b) | $\begin{array}{r} 4 \\ \times 5 \\ \hline 20 \end{array}$ | (c) | $\begin{array}{r} 1 \\ \times 8 \\ \hline 8 \end{array}$ | (d) | $\begin{array}{r} 2 \\ \times 10 \\ \hline 20 \end{array}$ | (e) | $\begin{array}{r} 0 \\ \times 3 \\ \hline 0 \end{array}$ |
|--------|---|-----|---|-----|--|-----|--|-----|--|

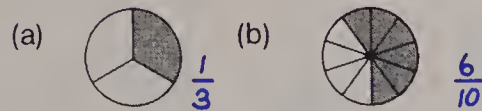
Divide.

|        |                            |     |                            |     |                             |     |                            |     |                             |
|--------|----------------------------|-----|----------------------------|-----|-----------------------------|-----|----------------------------|-----|-----------------------------|
| 4. (a) | $8 \overline{)64} \quad 8$ | (b) | $9 \overline{)54} \quad 6$ | (c) | $10 \overline{)40} \quad 4$ | (d) | $5 \overline{)45} \quad 9$ | (e) | $2 \overline{)20} \quad 10$ |
|--------|----------------------------|-----|----------------------------|-----|-----------------------------|-----|----------------------------|-----|-----------------------------|

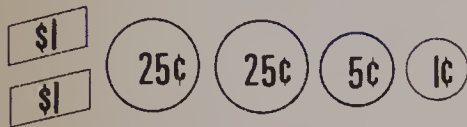
5. Is it a slide? Write Yes or No.



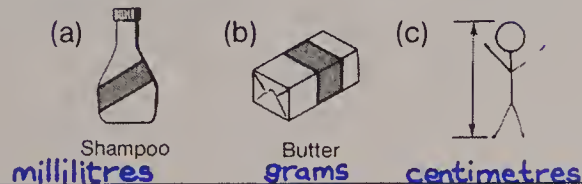
6. Write a fraction for the coloured part.



7. How much money?  $\$2.56$



8. Name a unit to measure each.



Chapters 1-10: cumulative review 293

**Using the Book** This page may be used for diagnostic and remedial as well as review purposes. Children should check their work, correct any errors, and review the pages that contain any problems of the type they missed. Some children can do this on their own while others may need help. If a large number of children have a particular problem incorrect, you may want to reteach that topic to the groups, then assign a duplicated worksheet to reinforce that topic or refer to an appropriate skill card in the BFA Computational Skills Kit I.

| Test Item  | Text Page Number |
|------------|------------------|
| 1(a)       | 47               |
| 1(b)       | 50-51            |
| 1(c), 1(d) | 133              |
| 1(e)       | 145              |
| 2(a)       | 62               |
| 2(b)       | 70-71            |
| 2(c), 2(d) | 134              |
| 2(e)       | 146              |
| 3(a)       | 269              |
| 3(b)       | 221              |
| 3(c)       | 170              |
| 3(d)       | 220              |
| 3(e)       | 171              |
| 4(a)       | 275              |
| 4(b)       | 276              |
| 4(c)       | 233              |
| 4(d)       | 231              |
| 4(e)       | 228              |
| 5          | 250              |
| 6          | 126              |
| 7          | 144              |
| 8          | 153              |



## Skills Check Up - Chapters 1 to 5

Give the correct answer for each: (a), (b), (c), or (d).

- $$\begin{array}{r} 54 \\ + 23 \\ \hline \end{array}$$
 (a) 31 (b) 77 (c) 87 (d) 81
- $$\begin{array}{r} 65 \\ + 48 \\ \hline \end{array}$$
 (a) 17 (b) 103 (c) 113 (d) 1013
- $$\begin{array}{r} 503 \\ + 109 \\ \hline \end{array}$$
 (a) 602 (b) 612 (c) 713 (d) 6012
- $$\begin{array}{r} 463 \\ + 457 \\ \hline \end{array}$$
 (a) 810 (b) 814 (c) 910 (d) 920
- $$\begin{array}{r} 68 \\ - 23 \\ \hline \end{array}$$
 (a) 45 (b) 54 (c) 56 (d) 91
- $$\begin{array}{r} 72 \\ - 36 \\ \hline \end{array}$$
 (a) 26 (b) 36 (c) 46 (d) 64
- $$\begin{array}{r} 680 \\ - 218 \\ \hline \end{array}$$
 (a) 462 (b) 472 (c) 468 (d) 478
- $$\begin{array}{r} 703 \\ - 446 \\ \hline \end{array}$$
 (a) 263 (b) 257 (c) 267 (d) 367

9. How many centimetres? (b)



- (a) 2 cm (b) 3 cm  
(c) 10 cm (d) 30 cm

11. In 3456, the 5 means: (b)

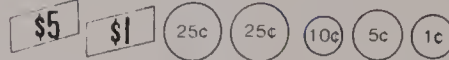
- (a) 5 ones (b) 5 tens  
(c) 5 hundreds (d) 5 thousands

13. The shaded portion is: (b)

- (a) 0.1 (b) 0.4  
(c) 0.5 (d) 1.14



10. How much money? (d)



- (a) \$5.56 (b) \$5.66  
(c) \$6.56 (d) \$6.66

12. The fraction shaded is: (c)

- (a)  $\frac{1}{6}$  (b)  $\frac{1}{10}$   
(c)  $\frac{6}{10}$  (d)  $\frac{1}{2}$



14. 236 red cars.  
48 blue cars.

How many altogether? (c)

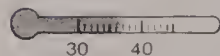
- (a) 188 (b) 274 (c) 284 (d) 716

## Skills Check Up - Chapters 6 to 10

Give the correct answer for each: (a), (b), (c), or (d).

- $3 \times 5$  (a) 10 (b) 12 (c) 15 (d) 18
- $4 \times 7$  (a) 28 (b) 32 (c) 42 (d) 47
- $$\begin{array}{r} 8 \\ \times 3 \\ \hline \end{array}$$
 (a) 12 (b) 16 (c) 24 (d) 32
- $$\begin{array}{r} 6 \\ \times 7 \\ \hline \end{array}$$
 (a) 21 (b) 24 (c) 28 (d) 42
- $27 \div 3$  (a) 8 (b) 9 (c) 10 (d) 21
- $32 - 8$  (a) 3 (b) 4 (c) 6 (d) 16
- $3 \overline{)18}$  (a) 3 (b) 6 (c) 9 (d) 12
- $9 \overline{)63}$  (a) 5 (b) 6 (c) 7 (d) 8

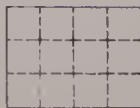
9. The temperature is: (a)



- (a) 37°C (b) 42°C  
(c) 45°C (d) 47°C

11. The area is: (c)

- (a) 8 (b) 10  
(c) 12 (d) 16

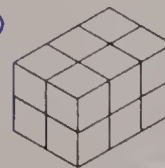


13. The slide is: (d)



10. The volume is: (c)

- (a) 6 (b) 10  
(c) 12 (d) 16



12. The time is: (d)

- (a) 02:20 (b) 01:30  
(c) 06:40 (d) 04:10



14. 9 plants.

3 flowers on each.

How many flowers? (d)

- (a) 3 (b) 6 (c) 12 (d) 27

## Extra Practice—Chapter One

Add

- |   |  |  |  |  |
|---|--|--|--|--|
| 1. (a) $\begin{array}{r} 4 \\ + 6^{10} \\ \hline \end{array}$ | (b) $\begin{array}{r} 3 \\ + 2^5 \\ \hline \end{array}$    | (c) $\begin{array}{r} 2 \\ + 7^9 \\ \hline \end{array}$    | (d) $\begin{array}{r} 5 \\ + 5^{10} \\ \hline \end{array}$ | (e) $\begin{array}{r} 6 \\ + 3^9 \\ \hline \end{array}$    |
| 2. (a) $\begin{array}{r} 2 \\ + 8^{10} \\ \hline \end{array}$ | (b) $\begin{array}{r} 5 \\ + 4^9 \\ \hline \end{array}$    | (c) $\begin{array}{r} 3 \\ + 3^6 \\ \hline \end{array}$    | (d) $\begin{array}{r} 1 \\ + 7^8 \\ \hline \end{array}$    | (e) $\begin{array}{r} 5 \\ + 2^7 \\ \hline \end{array}$    |
| 3. (a) $\begin{array}{r} 6 \\ + 9^{15} \\ \hline \end{array}$ | (b) $\begin{array}{r} 8 \\ + 8^{16} \\ \hline \end{array}$ | (c) $\begin{array}{r} 5 \\ + 7^{12} \\ \hline \end{array}$ | (d) $\begin{array}{r} 8 \\ + 5^{13} \\ \hline \end{array}$ | (e) $\begin{array}{r} 7 \\ + 4^{11} \\ \hline \end{array}$ |
| 4. (a) $\begin{array}{r} 8 \\ + 9^{17} \\ \hline \end{array}$ | (b) $\begin{array}{r} 7 \\ + 6^{13} \\ \hline \end{array}$ | (c) $\begin{array}{r} 4 \\ + 9^{13} \\ \hline \end{array}$ | (d) $\begin{array}{r} 8 \\ + 6^{14} \\ \hline \end{array}$ | (e) $\begin{array}{r} 9 \\ + 9^{18} \\ \hline \end{array}$ |
| 5. (a) $\begin{array}{r} 7 \\ + 8^{15} \\ \hline \end{array}$ | (b) $\begin{array}{r} 2 \\ + 9^{11} \\ \hline \end{array}$ | (c) $\begin{array}{r} 7 \\ + 7^{14} \\ \hline \end{array}$ | (d) $\begin{array}{r} 8 \\ + 3^{11} \\ \hline \end{array}$ | (e) $\begin{array}{r} 5 \\ + 6^{11} \\ \hline \end{array}$ |

Subtract

- |  |   |  |   |  |
|--|---|--|---|--|
| 6. (a) $\begin{array}{r} 9 \\ - 2^7 \\ \hline \end{array}$   | (b) $\begin{array}{r} 12 \\ - 6^6 \\ \hline \end{array}$    | (c) $\begin{array}{r} 8 \\ - 3^5 \\ \hline \end{array}$  | (d) $\begin{array}{r} 15 \\ - 7^8 \\ \hline \end{array}$    | (e) $\begin{array}{r} 10 \\ - 7^3 \\ \hline \end{array}$ |
| 7. (a) $\begin{array}{r} 11 \\ - 7^4 \\ \hline \end{array}$  | (b) $\begin{array}{r} 17 \\ - 8^9 \\ \hline \end{array}$    | (c) $\begin{array}{r} 14 \\ - 7^7 \\ \hline \end{array}$ | (d) $\begin{array}{r} 9 \\ - 5^4 \\ \hline \end{array}$     | (e) $\begin{array}{r} 13 \\ - 9^4 \\ \hline \end{array}$ |
| 8. (a) $\begin{array}{r} 16 \\ - 8^8 \\ \hline \end{array}$  | (b) $\begin{array}{r} 18 \\ - 9^9 \\ \hline \end{array}$    | (c) $\begin{array}{r} 17 \\ - 9^8 \\ \hline \end{array}$ | (d) $\begin{array}{r} 11 \\ - 7^4 \\ \hline \end{array}$    | (e) $\begin{array}{r} 15 \\ - 6^9 \\ \hline \end{array}$ |
| 9. (a) $\begin{array}{r} 12 \\ - 4^8 \\ \hline \end{array}$  | (b) $\begin{array}{r} 10 \\ - 8^2 \\ \hline \end{array}$    | (c) $\begin{array}{r} 13 \\ - 7^6 \\ \hline \end{array}$ | (d) $\begin{array}{r} 16 \\ - 0^6 \\ \hline \end{array}$    | (e) $\begin{array}{r} 14 \\ - 6^8 \\ \hline \end{array}$ |
| 10. (a) $\begin{array}{r} 17 \\ - 9^8 \\ \hline \end{array}$ | (b) $\begin{array}{r} 18 \\ - 3^{15} \\ \hline \end{array}$ | (c) $\begin{array}{r} 11 \\ - 8^3 \\ \hline \end{array}$ | (d) $\begin{array}{r} 18 \\ - 6^{12} \\ \hline \end{array}$ | (e) $\begin{array}{r} 15 \\ - 8^7 \\ \hline \end{array}$ |

## Extra Practice—Chapter Two

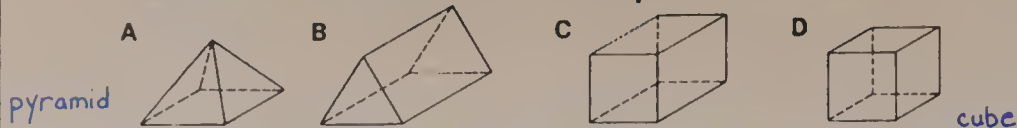
Add.

- |   |  |   |   |   |
|---|--|---|---|---|
| 1. (a) $\begin{array}{r} 35 \\ + 43^9 \\ \hline \end{array}$      | (b) $\begin{array}{r} 6 \\ + 62^{68} \\ \hline \end{array}$    | (c) $\begin{array}{r} 25 \\ + 32^8 \\ \hline \end{array}$       | (d) $\begin{array}{r} 3 \\ + 44^{47} \\ \hline \end{array}$     | (e) $\begin{array}{r} 72 \\ + 7^7^9 \\ \hline \end{array}$      |
| 2. (a) $\begin{array}{r} 12 \\ + 45^{57} \\ \hline \end{array}$   | (b) $\begin{array}{r} 34 \\ + 33^{67} \\ \hline \end{array}$   | (c) $\begin{array}{r} 85 \\ + 10^{95} \\ \hline \end{array}$    | (d) $\begin{array}{r} 32 \\ + 57^{89} \\ \hline \end{array}$    | (e) $\begin{array}{r} 53 \\ + 34^{87} \\ \hline \end{array}$    |
| 3. (a) $\begin{array}{r} 47 \\ + 34^{81} \\ \hline \end{array}$   | (b) $\begin{array}{r} 38 \\ + 25^{63} \\ \hline \end{array}$   | (c) $\begin{array}{r} 19 \\ + 36^{55} \\ \hline \end{array}$    | (d) $\begin{array}{r} 57 \\ + 17^{74} \\ \hline \end{array}$    | (e) $\begin{array}{r} 79 \\ + 19^{98} \\ \hline \end{array}$    |
| 4. (a) $\begin{array}{r} 134 \\ + 27^{161} \\ \hline \end{array}$ | (b) $\begin{array}{r} 339 \\ + 43^{382} \\ \hline \end{array}$ | (c) $\begin{array}{r} 276 \\ + 416^{692} \\ \hline \end{array}$ | (d) $\begin{array}{r} 527 \\ + 228^{755} \\ \hline \end{array}$ | (e) $\begin{array}{r} 716 \\ + 139^{855} \\ \hline \end{array}$ |

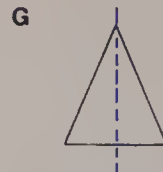
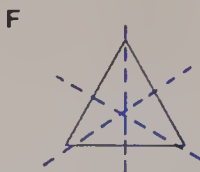
Subtract.

- |  |   |   |   |   |
|--|---|---|---|---|
| 5. (a) $\begin{array}{r} 17 \\ - 3^{14} \\ \hline \end{array}$     | (b) $\begin{array}{r} 15 \\ - 2^{13} \\ \hline \end{array}$     | (c) $\begin{array}{r} 18 \\ - 7^{11} \\ \hline \end{array}$     | (d) $\begin{array}{r} 16 \\ - 4^{12} \\ \hline \end{array}$     | (e) $\begin{array}{r} 14 \\ - 2^{12} \\ \hline \end{array}$     |
| 6. (a) $\begin{array}{r} 87 \\ - 54^{33} \\ \hline \end{array}$    | (b) $\begin{array}{r} 76 \\ - 43^{33} \\ \hline \end{array}$    | (c) $\begin{array}{r} 98 \\ - 24^{74} \\ \hline \end{array}$    | (d) $\begin{array}{r} 49 \\ - 32^{17} \\ \hline \end{array}$    | (e) $\begin{array}{r} 57 \\ - 25^{32} \\ \hline \end{array}$    |
| 7. (a) $\begin{array}{r} 679 \\ - 32^{647} \\ \hline \end{array}$  | (b) $\begin{array}{r} 878 \\ - 54^{824} \\ \hline \end{array}$  | (c) $\begin{array}{r} 584 \\ - 271^{313} \\ \hline \end{array}$ | (d) $\begin{array}{r} 897 \\ - 415^{482} \\ \hline \end{array}$ | (e) $\begin{array}{r} 695 \\ - 254^{441} \\ \hline \end{array}$ |
| 8. (a) $\begin{array}{r} 977 \\ - 240^{737} \\ \hline \end{array}$ | (b) $\begin{array}{r} 758 \\ - 506^{252} \\ \hline \end{array}$ | (c) $\begin{array}{r} 843 \\ - 205^{638} \\ \hline \end{array}$ | (d) $\begin{array}{r} 482 \\ - 166^{316} \\ \hline \end{array}$ | (e) $\begin{array}{r} 692 \\ - 413^{279} \\ \hline \end{array}$ |
| 9. (a) $\begin{array}{r} 503 \\ - 291^{212} \\ \hline \end{array}$ | (b) $\begin{array}{r} 654 \\ - 162^{492} \\ \hline \end{array}$ | (c) $\begin{array}{r} 817 \\ - 498^{319} \\ \hline \end{array}$ | (d) $\begin{array}{r} 786 \\ - 298^{488} \\ \hline \end{array}$ | (e) $\begin{array}{r} 800 \\ - 592^{208} \\ \hline \end{array}$ |

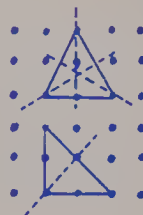
## Extra Practice—Chapter Three



1. Give the name of each shape.
2. Make skeleton shapes of each.
3. How many *different* shaped faces on each?
4. Trace the *different* faces from each shape.
5. Cut out each face.  
Find lines of symmetry by folding.



6. Which triangle has:
  - (a) 3 sides the same length? **F**
  - (b) 2 sides the same length? **G**
  - (c) no sides the same length? **E**
7. Use dot paper.
  - (a) Draw a triangle with 3 sides the same length.
  - (b) Draw a triangle with 2 sides the same length.
8. Cut out the triangles you have drawn.  
Fold to find lines of symmetry.



## Extra Practice—Chapter Four

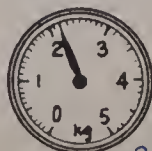
1. What is the value of each underlined digit?
 

|                   |                    |               |                    |                   |
|-------------------|--------------------|---------------|--------------------|-------------------|
| (a) 3256          | (b) 5614           | (c) 7108      | (d) 9145           | (e) 6812          |
| <u>5</u> tens     | <u>6</u> hundreds  | <u>0</u> tens | <u>9</u> thousands | <u>8</u> hundreds |
| (f) 6040          | (g) 7506           | (h) 8349      | (i) 6021           | (j) 256           |
| <u>0</u> hundreds | <u>7</u> thousands | <u>9</u> ones | <u>2</u> tens      | <u>2</u> hundreds |
2. Write the next four numerals in the pattern.
 

|   |   |
|---|---|
| (a) 2232, 2233, 2234, <u>2235</u> , <u>2236</u> , <u>2237</u> , <u>2238</u> | (b) 1989, 1990, 1991, <u>1992</u> , <u>1993</u> , <u>1994</u> , <u>1995</u> |
| (c) 3086, 3087, 3088, <u>3089</u> , <u>3090</u> , <u>3091</u> , <u>3092</u> | (d) 4996, 4997, 4998, <u>4999</u> , <u>5000</u> , <u>5001</u> , <u>5002</u> |
3. Compare. Use  $>$ ,  $<$  or  $=$ .
 

|                 |                 |                 |                 |
|-----------------|-----------------|-----------------|-----------------|
| (a) 3215 ● 3216 | (b) 8435 ● 8521 | (c) 7314 ● 914  | (d) 2041 ● 543  |
| (e) 448 ● 1234  | (f) 5732 ● 7532 | (g) 4314 ● 4314 | (h) 8601 ● 8801 |
4. Add.
 

|  |  |  |  |  |
|--|--|--|--|--|
| (a) $\begin{array}{r} 375 \\ + 804 \\ \hline 1179 \end{array}$ | (b) $\begin{array}{r} 738 \\ + 726 \\ \hline 1464 \end{array}$ | (c) $\begin{array}{r} 946 \\ + 473 \\ \hline 1419 \end{array}$ | (d) $\begin{array}{r} 846 \\ + 479 \\ \hline 1325 \end{array}$ | (e) $\begin{array}{r} 609 \\ + 399 \\ \hline 1008 \end{array}$ |
| (f) $\begin{array}{r} 864 \\ + 238 \\ \hline 1102 \end{array}$ | (g) $\begin{array}{r} 764 \\ + 299 \\ \hline 1063 \end{array}$ | (h) $\begin{array}{r} 873 \\ + 489 \\ \hline 1362 \end{array}$ | (i) $\begin{array}{r} 321 \\ + 999 \\ \hline 1320 \end{array}$ | (j) $\begin{array}{r} 642 \\ + 358 \\ \hline 1000 \end{array}$ |
5. Round to the nearest kilogram.
6. Round to the nearest 10 kg.



2 kg

5 kg

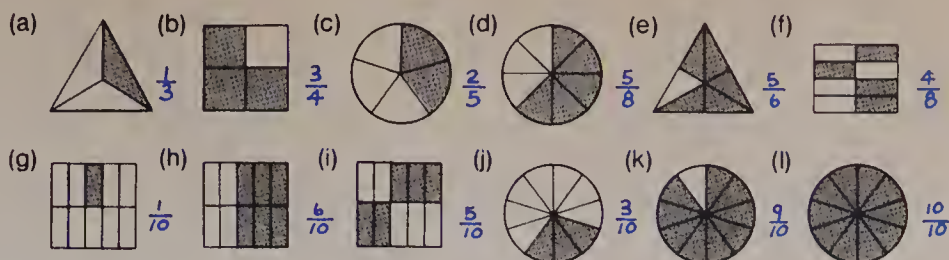
40 kg

40 kg

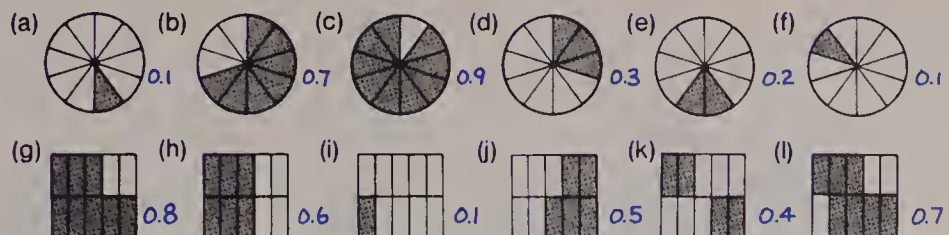


## Extra Practice — Chapter Five

1. Write the fraction for the coloured part.



2. Write the decimal for the coloured part.



3. Add.

|   |   |   |  |  |   |
|---|---|---|--|--|---|
| (a) $\begin{array}{r} 0.1 \\ + 0.3 \\ \hline 0.4 \end{array}$ | (b) $\begin{array}{r} 0.5 \\ + 0.4 \\ \hline 0.9 \end{array}$ | (c) $\begin{array}{r} 0.6 \\ + 0.2 \\ \hline 0.8 \end{array}$ | (d) $\begin{array}{r} \$4.32 \\ + 1.36 \\ \hline \$5.68 \end{array}$ | (e) $\begin{array}{r} \$6.51 \\ + 3.28 \\ \hline \$9.79 \end{array}$ | (f) $\begin{array}{r} \$16.44 \\ + 23.23 \\ \hline \$39.67 \end{array}$ |
|---|---|---|--|--|---|

4. Subtract.

|   |   |   |  |  |   |
|---|---|---|--|--|---|
| (a) $\begin{array}{r} 0.6 \\ - 0.3 \\ \hline 0.3 \end{array}$ | (b) $\begin{array}{r} 0.9 \\ - 0.1 \\ \hline 0.8 \end{array}$ | (c) $\begin{array}{r} 0.8 \\ - 0.5 \\ \hline 0.3 \end{array}$ | (d) $\begin{array}{r} \$6.94 \\ - 2.82 \\ \hline \$4.12 \end{array}$ | (e) $\begin{array}{r} \$8.59 \\ - 3.49 \\ \hline \$5.10 \end{array}$ | (f) $\begin{array}{r} \$56.78 \\ - 32.23 \\ \hline \$24.55 \end{array}$ |
|---|---|---|--|--|---|

## Extra Practice — Chapter Six

Multiply.

1. (a)  $5 \times 2 = 10$  (b)  $4 \times 3 = 12$  (c)  $2 \times 1 = 2$  (d)  $4 \times 4 = 16$  (e)  $2 \times 0 = 0$

2. (a)  $6 \times 1 = 6$  (b)  $3 \times 3 = 9$  (c)  $2 \times 4 = 8$  (d)  $5 \times 3 = 15$  (e)  $5 \times 5 = 25$

3. (a)  $5 \times 0 = 0$  (b)  $5 \times 4 = 20$  (c)  $5 \times 1 = 5$  (d)  $10 \times 1 = 10$  (e)  $3 \times 1 = 3$

4. (a) 
$$\begin{array}{r} 0 \\ \times 5 \\ \hline 0 \end{array}$$
 (b) 
$$\begin{array}{r} 2 \\ \times 2 \\ \hline 4 \end{array}$$
 (c) 
$$\begin{array}{r} 5 \\ \times 3 \\ \hline 15 \end{array}$$
 (d) 
$$\begin{array}{r} 3 \\ \times 4 \\ \hline 12 \end{array}$$
 (e) 
$$\begin{array}{r} 5 \\ \times 2 \\ \hline 10 \end{array}$$

5. (a) 
$$\begin{array}{r} 4 \\ \times 1 \\ \hline 4 \end{array}$$
 (b) 
$$\begin{array}{r} 2 \\ \times 3 \\ \hline 6 \end{array}$$
 (c) 
$$\begin{array}{r} 4 \\ \times 5 \\ \hline 20 \end{array}$$
 (d) 
$$\begin{array}{r} 1 \\ \times 3 \\ \hline 3 \end{array}$$
 (e) 
$$\begin{array}{r} 4 \\ \times 4 \\ \hline 16 \end{array}$$

6. (a) 
$$\begin{array}{r} 5 \\ \times 5 \\ \hline 25 \end{array}$$
 (b) 
$$\begin{array}{r} 4 \\ \times 2 \\ \hline 8 \end{array}$$
 (c) 
$$\begin{array}{r} 7 \\ \times 0 \\ \hline 0 \end{array}$$
 (d) 
$$\begin{array}{r} 4 \\ \times 3 \\ \hline 12 \end{array}$$
 (e) 
$$\begin{array}{r} 10 \\ \times 0 \\ \hline 0 \end{array}$$

Divide.

7. (a)  $15 \div 5 = 3$  (b)  $20 \div 4 = 5$  (c)  $10 \div 2 = 5$  (d)  $6 \div 3 = 2$  (e)  $12 \div 4 = 3$

8. (a)  $4 \div 2 = 2$  (b)  $5 \div 5 = 1$  (c)  $20 \div 5 = 4$  (d)  $8 \div 4 = 2$  (e)  $4 \div 2 = 2$

9. (a)  $9 \div 3 = 3$  (b)  $8 \div 2 = 4$  (c)  $10 \div 5 = 2$  (d)  $18 \div 2 = 9$  (e)  $3 \div 3 = 1$

10. (a)  $25 \div 5 = 5$  (b)  $10 \div 1 = 10$  (c)  $12 \div 3 = 4$  (d)  $6 \div 2 = 3$  (e)  $9 \div 1 = 9$

11. (a)  $16 \div 2 = 8$  (b)  $15 \div 3 = 5$  (c)  $20 \div 2 = 10$  (d)  $12 \div 1 = 12$  (e)  $4 \div 4 = 1$

12. (a)  $12 \div 2 = 6$  (b)  $16 \div 4 = 4$  (c)  $15 \div 3 = 5$  (d)  $8 \div 1 = 8$  (e)  $20 \div 5 = 4$

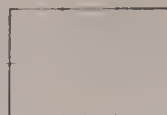
## Extra Practice—Chapter Seven

1. Find the perimeter.  $\longrightarrow$  1 cm.

(a)



(b)



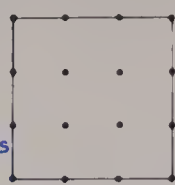
(c)



2. Find the area.  $\longrightarrow$  1 cm.

(a)

9 square centimetres



(b)

7 square centimetres



(c)

6 square centimetres



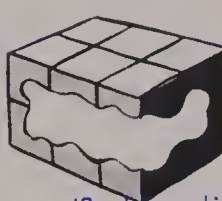
3. Find the volume.

(a)

24 cubic centimetres

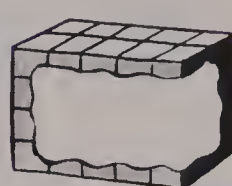


(b)



12 cubic centimetres

(c)



40 cubic centimetres

4. Write the time in the form 06:35.

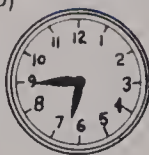
(a)

02:30



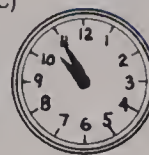
(b)

06:45



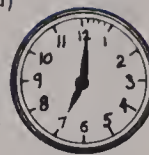
(c)

10:55



(d)

07:01



(e)

11:25



302 Extra practice — chapter seven

## Extra Practice—Chapter Eight

Multiply.

1. (a)

$$\begin{array}{r} 8 \\ \times 4 \\ \hline 32 \end{array}$$

(b)  $\begin{array}{r} 5 \\ \times 5 \\ \hline 25 \end{array}$

(c)  $\begin{array}{r} 9 \\ \times 3 \\ \hline 27 \end{array}$

(d)  $\begin{array}{r} 6 \\ \times 2 \\ \hline 12 \end{array}$

(e)  $\begin{array}{r} 1 \\ \times 9 \\ \hline 9 \end{array}$

2. (a)

$$\begin{array}{r} 5 \\ \times 4 \\ \hline 20 \end{array}$$

(b)  $\begin{array}{r} 1 \\ \times 6 \\ \hline 6 \end{array}$

(c)  $\begin{array}{r} 7 \\ \times 3 \\ \hline 21 \end{array}$

(d)  $\begin{array}{r} 9 \\ \times 4 \\ \hline 36 \end{array}$

(e)  $\begin{array}{r} 7 \\ \times 2 \\ \hline 14 \end{array}$

3. (a)

$$\begin{array}{r} 6 \\ \times 5 \\ \hline 30 \end{array}$$

(b)  $\begin{array}{r} 0 \\ \times 9 \\ \hline 0 \end{array}$

(c)  $\begin{array}{r} 5 \\ \times 2 \\ \hline 10 \end{array}$

(d)  $\begin{array}{r} 6 \\ \times 5 \\ \hline 30 \end{array}$

(e)  $\begin{array}{r} 4 \\ \times 4 \\ \hline 16 \end{array}$

4. (a)

$$\begin{array}{r} 5 \\ \times 3 \\ \hline 15 \end{array}$$

(b)  $\begin{array}{r} 9 \\ \times 5 \\ \hline 45 \end{array}$

(c)  $\begin{array}{r} 6 \\ \times 4 \\ \hline 24 \end{array}$

(d)  $\begin{array}{r} 8 \\ \times 0 \\ \hline 0 \end{array}$

(e)  $\begin{array}{r} 4 \\ \times 3 \\ \hline 12 \end{array}$

5. (a)

$$\begin{array}{r} 9 \\ \times 10 \\ \hline 90 \end{array}$$

(b)  $\begin{array}{r} 8 \\ \times 3 \\ \hline 24 \end{array}$

(c)  $\begin{array}{r} 7 \\ \times 5 \\ \hline 35 \end{array}$

(d)  $\begin{array}{r} 5 \\ \times 4 \\ \hline 20 \end{array}$

(e)  $\begin{array}{r} 8 \\ \times 5 \\ \hline 40 \end{array}$

Divide.

6. (a)  $25 \div 5 = 5$  (b)  $12 \div 4 = 3$  (c)  $15 \div 3 = 5$  (d)  $20 \div 4 = 5$  (e)  $16 \div 4 = 4$

7. (a)  $10 \div 2 = 5$  (b)  $20 \div 5 = 4$  (c)  $18 \div 2 = 9$  (d)  $27 \div 3 = 9$  (e)  $24 \div 6 = 4$

8. (a)  $15 \div 5 = 3$  (b)  $24 \div 4 = 6$  (c)  $21 \div 7 = 3$  (d)  $10 \div 1 = 10$  (e)  $12 \div 6 = 2$

9. (a)  $5 \overline{)20} = 4$  (b)  $10 \overline{)80} = 8$  (c)  $3 \overline{)21} = 7$  (d)  $4 \overline{)28} = 7$  (e)  $5 \overline{)40} = 8$

10. (a)  $2 \overline{)18} = 9$  (b)  $4 \overline{)32} = 8$  (c)  $5 \overline{)25} = 5$  (d)  $10 \overline{)90} = 9$  (e)  $2 \overline{)20} = 10$

11. (a)  $10 \overline{)70} = 7$  (b)  $3 \overline{)30} = 10$  (c)  $4 \overline{)24} = 6$  (d)  $5 \overline{)35} = 7$  (e)  $4 \overline{)36} = 9$

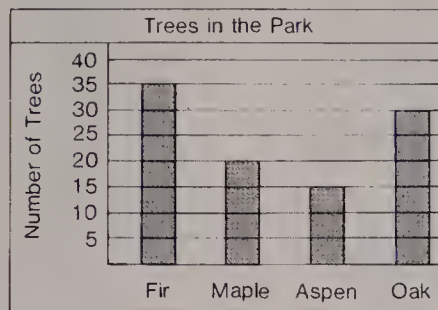
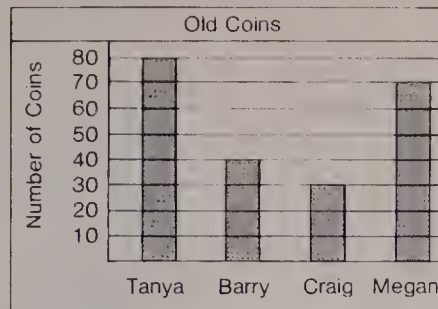
Extra practice — chapter eight 303

## Extra Practice—Chapter Nine

1. Draw each.

- (a) a line  $\longleftrightarrow$  (b) a segment  $\text{---}$  (c) an angle  $\angle$   
 (d) a ray  $\text{---}\rightarrow$  (e) a closed curve  $\square$  (f) an open curve  $\cup$

2. Which are slides? **A and C**



3. Old Coins

- (a) Who has the most coins? **Tanya**  
 (b) Who has the fewest coins? **Craig**  
 (c) How many coins does Megan have? **70**  
 (d) Who has twice as many coins as Barry? **Tanya**

4. Trees in the Park

- (a) What tree is most common? **fir**  
 (b) What tree is least common? **aspen**  
 (c) How would you show 30 walnut trees? **with a vertical bar going up to the 30 line**  
 (d) How many trees altogether? **100**

304 Extra practice — chapter nine

## Extra Practice—Chapter Ten

Multiply.

1. (a)  $\begin{array}{r} 7 \\ \times 9 \\ \hline 63 \end{array}$  (b)  $\begin{array}{r} 9 \\ \times 7 \\ \hline 63 \end{array}$  (c)  $\begin{array}{r} 7 \\ \times 6 \\ \hline 42 \end{array}$  (d)  $\begin{array}{r} 9 \\ \times 8 \\ \hline 72 \end{array}$  (e)  $\begin{array}{r} 10 \\ \times 0 \\ \hline 0 \end{array}$   
 2. (a)  $\begin{array}{r} 9 \\ \times 6 \\ \hline 54 \end{array}$  (b)  $\begin{array}{r} 4 \\ \times 9 \\ \hline 36 \end{array}$  (c)  $\begin{array}{r} 5 \\ \times 8 \\ \hline 40 \end{array}$  (d)  $\begin{array}{r} 9 \\ \times 5 \\ \hline 45 \end{array}$  (e)  $\begin{array}{r} 5 \\ \times 7 \\ \hline 35 \end{array}$   
 3. (a)  $\begin{array}{r} 8 \\ \times 6 \\ \hline 48 \end{array}$  (b)  $\begin{array}{r} 7 \\ \times 8 \\ \hline 56 \end{array}$  (c)  $\begin{array}{r} 7 \\ \times 7 \\ \hline 49 \end{array}$  (d)  $\begin{array}{r} 8 \\ \times 5 \\ \hline 40 \end{array}$  (e)  $\begin{array}{r} 5 \\ \times 9 \\ \hline 45 \end{array}$   
 4. (a)  $\begin{array}{r} 9 \\ \times 9 \\ \hline 81 \end{array}$  (b)  $\begin{array}{r} 6 \\ \times 8 \\ \hline 48 \end{array}$  (c)  $\begin{array}{r} 37 \\ \times 0 \\ \hline 0 \end{array}$  (d)  $\begin{array}{r} 6 \\ \times 7 \\ \hline 42 \end{array}$  (e)  $\begin{array}{r} 8 \\ \times 8 \\ \hline 64 \end{array}$   
 5. (a)  $\begin{array}{r} 8 \\ \times 7 \\ \hline 56 \end{array}$  (b)  $\begin{array}{r} 6 \\ \times 9 \\ \hline 54 \end{array}$  (c)  $\begin{array}{r} 4 \\ \times 8 \\ \hline 32 \end{array}$  (d)  $\begin{array}{r} 8 \\ \times 9 \\ \hline 72 \end{array}$  (e)  $\begin{array}{r} 9 \\ \times 6 \\ \hline 54 \end{array}$

Divide.

6. (a)  $7 \overline{)49} \text{ } 7$  (b)  $9 \overline{)72} \text{ } 8$  (c)  $6 \overline{)36} \text{ } 6$  (d)  $4 \overline{)24} \text{ } 6$  (e)  $8 \overline{)40} \text{ } 5$   
 7. (a)  $6 \overline{)48} \text{ } 8$  (b)  $8 \overline{)64} \text{ } 8$  (c)  $9 \overline{)81} \text{ } 9$  (d)  $5 \overline{)35} \text{ } 7$  (e)  $7 \overline{)63} \text{ } 9$   
 8. (a)  $8 \overline{)24} \text{ } 3$  (b)  $7 \overline{)56} \text{ } 8$  (c)  $6 \overline{)42} \text{ } 7$  (d)  $9 \overline{)27} \text{ } 3$  (e)  $8 \overline{)56} \text{ } 7$   
 9. (a)  $10 \overline{)30} \text{ } 3$  (b)  $9 \overline{)54} \text{ } 6$  (c)  $7 \overline{)42} \text{ } 6$  (d)  $8 \overline{)32} \text{ } 4$  (e)  $10 \overline{)70} \text{ } 7$   
 10. (a)  $8 \overline{)48} \text{ } 6$  (b)  $10 \overline{)100} \text{ } 10$  (c)  $9 \overline{)45} \text{ } 5$  (d)  $7 \overline{)14} \text{ } 2$  (e)  $6 \overline{)24} \text{ } 4$   
 11. (a)  $10 \overline{)60} \text{ } 6$  (b)  $9 \overline{)63} \text{ } 7$  (c)  $6 \overline{)54} \text{ } 9$  (d)  $3 \overline{)27} \text{ } 9$  (e)  $3 \overline{)30} \text{ } 10$

Extra practice — chapter ten 305



# INDEX

## Addends, 15

### Addition

- 1-digit numbers, 8-10, 12-13, 14-15, 27, 38 • 2-digit numbers, 17, 39-40, 47, 49, 51, 59, 92 • 3-digit numbers, 44, 48-49, 51, 53, 54, 76, 117 •
- 4-digit numbers, 107-109 •
- decimals, 133, 135 • money, 145 •
- practice, 13, 27, 34, 40, 51, 53-54, 108, 158, 247

### Addition chart, 12

### Angles, 248-249

### Area

- nonstandard units, 193 • square centimetres, 194-195 • square units, 192

### Arrays for multiplying

- by 2, 161 • by 3, 163 • by 4, 166 •
- by 5, 169 • by 6, 266, 268 • by 7, 267-268 • by 8, 269, 271 • by 9, 270-271

### Ball (sphere), 82

### Calendar, 203

### Capacity, 137-139, 200

### Centimetres, 37, 109-110, 117, 189-191

### Charts, 253

### Choosing number sentences, 202

### Circles, 92-93

### Closed curves, 245

### Commutative property, 10

### Comparing numbers, 6-7, 43, 106, 286 • fractions, 127-128

### Cone, 82, 85

### Construction of

- circles, 93 • metrestick, 113 •
- symmetrical figures, 90-91 • three-dimensional shapes, 84

### Cube, 82, 85, 196

### Cubic centimetre, 198-199

### Curved shapes, 82

### Curves, 245

### Cylinder, 82, 85

### Decimal notation, 130

### Decimetre, 111, 113

### Degrees Celsius, 204

### Difference

- 1-digit, 21, 23-27 • 2-digit, 55-56, 58, 61, 63 • 3-digit, 66, 68, 71, 74-76 • decimals, 130-135 • money, 146

### Division, 175-183, 217 • by 0, 237 •

- by 1, 181 • by 2, 228 • by 3, 229 •
- by 4, 230 • by 5, 231 • by 6, 272 •
- by 7, 273 • by 8, 275 • by 9, 276 •
- by 10, 283 • and multiplication, 176, 179-180, 227 • and subtraction, 177 • practice, 232, 274, 278, 285 • quotient, 179 •
- sharing, 175, 222 • with remainders, 290-291

### Drawing

- polygons, 89 • rectangles, 86 •
- triangles, 88

### Equal parts, 125

### Estimation, 115 • of capacity, 137

- 153 • of length, 114-115, 153 •
- of mass, 121, 140, 153

### Extraneous information, 142

### Faces of solids, 83

### Fractions, 126-131, 288 • and wholes,

- 131 • greater than 1, 132

### Function machines, 72-73

### Grams, 118, 201

### Graphs, 254-255 • bar, 258-260 •

- pictographs, 256-257

### Greater than, 6-7, 43, 106, 127

### Inverses and division, 227

### Kilogram, 118, 201

### Kilometre, 116

### Less than, 6-7, 43, 106, 127

### Line symmetry, 90-91, 93

### Lines, 246

### Litre, 137-138, 200

### Making change, 151-152

### Mass, 118-121, 140, 201

### Measuring

- centimetres, 37, 109, 189, 191 •
- decimetres, 111 • metres, 59, 112-114

### Metre, 59, 112-113 • and centimetres,

- 112 • and decimetres, 113

### Millilitres, 138-139, 200

### Money, 92, 143-152

### Multiplication, 160-171, 220-225,

- 266-270 • by 0, 171 • by 1, 170 •
- by 2, 160-161, 220 • by 3, 162-163, 220 • by 4, 165-166, 221 • by 5, 168-169, 223 • by 6, 266 • by 7, 267 • by 8, 269 • by 9, 270 • by 10, 225, 281 • by 100, 282 • in horizontal rows, 159 • in vertical columns, 172 • practice, 182, 224, 232, 265, 278, 285

### Multiplication and division

- ladders, 238 • rings, 184-185

### Multiplication table, 280 • used in division, 236, 284

### Number families, 234-235, 240

### Number lines (rulers), 38, 55

### Number sentences, 209

### Numbers

- even, 20 • odd, 20

### Open curves, 245

### Ordinal numbers, 11

### Patterns

- in 2's, 18 • in 3's, 19 • in 4's, 164 • in 5's, 167 • in subtraction, 33

### Perimeter, 190-191

### Pictographs, 256-257

### Place-value charts

- tens and ones, 4, 17, 39, 45-47, 56, 58 • tens and hundreds, 44, 48, 50, 52, 65, 67, 70 • thousands, 102, 104-106 • with money, 144

### Point, 246

### Polygons, 89

### Product, 159 • 2-digit, 159-163, 165-166, 168-170

### Pyramid, 81, 85

### Quotient, 178

### Ray, 246

### Rectangles, 86, 94

### Rectangular prism, 81, 85

### Regrouping for

- addition, 45-54 • subtraction, 60-63, 67-71, 74-75

### Related sentences, 2-3, 5, 22

### Relating division and multiplication,

- 176, 179, 180, 218-219

### Remainders, 290-291

### Roman numerals, 32

### Rounding

- to nearest centimetre, 110, 189 •
- to nearest kilogram, 120, 201

### Same shape, 251

### Same size, 125

### Segment, 246

### Similar shapes, 95

### Slides, 250

### Sorting, 96-97

### Sphere, 82

### Square, 86, 94

### Square centimetres, 194-195

### Subtraction

- 1-digit numbers, 21, 23, 26-27 •
  - 2-digit numbers, 24-27, 55-56, 58, 61, 63 • 3-digit numbers, 66-68, 71, 74-76 • of decimals, 134-135 • of money, 146 • practice, 27, 34, 61, 63, 66, 68, 71, 76, 158, 247
- ### Sum, 15 • 1-digit, 8-10, 14-15 •
- 2-digit, 12-13, 15, 17, 30-31, 38-40, 47, 49, 51, 59, 92 • 3-digit, 44, 48-49, 51, 53-54, 76 • 4-digit, 107-109, 117 • of decimals, 133, 135 • of money, 145

### Symmetrical figures, 90-91, 93

### Tally marks, 167, 254-255

### Temperature, 204

### Tens, 2-3

### Tenths, 129-132

### Thousands, 101-106

### Three-dimensional shapes, 81-85

### Time, 206-208, 210-213

### Tracing

- angles, 248-249 • shapes, 83

### Triangles, 87, 94

### Triangular prism, 81, 83, 85

### Volume

- cubic centimetres, 198 • cubic units, 196-197

### Whole numbers, 1-2, 5

### Word problems in

- addition, 14, 16, 28-29, 31, 49, 77, 108-109, 117, 141, 202, 252 •
- area, 205 • bar graphs, 259 •
- capacity, 139 • charts, 253 •
- choosing number sentences, 202 •
- decimals, 136 • division, 182-183, 272-273, 275-277, 287 •
- extraneous information, 142 •
- fractions, 136 • measurement, 117 •
- money, 147, 150-152, 261 •
- multiplication, 174, 182, 226, 239, 277 • pictographs, 256 •
- reading word problems, 14 • subtraction, 26, 28-29, 57, 64, 68-69, 77, 202, 252 •
- time, 212-213 • writing number sentences, 209

### Writing numerals, 1-5, 11, 42, 103-104

### Zero, 74-75

### Zero in subtraction, 74-75







AUG 01 1986

QA 107 H78 1980 BK-3TCH-ED- C-2  
HOLT MATHEMATICS SYSTEM/

39529861 CURR



\*000019138569\*

QA 107 H78 1980  
bk.3 tch.ed. C. 2  
Holt mathematics system /

39529861 CURR

Marshall P. Bye  
Wendy E. Auger  
Jean Bennie  
Ronald S. Sauer  
Neil Williamson

 Holt, Rinehart and Winston of Canada, Limited

ISBN 0-0